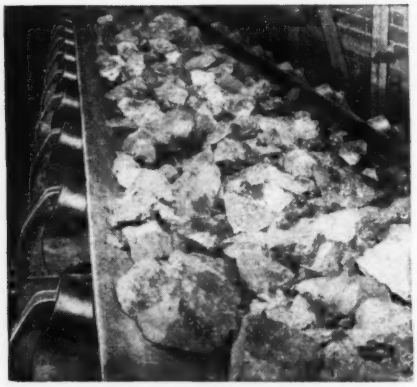
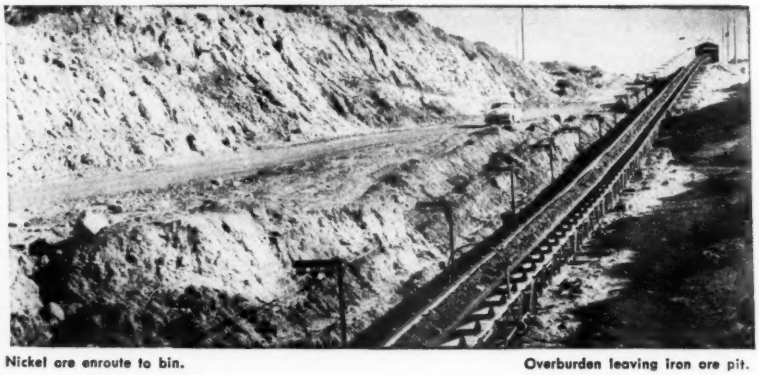
Mining CONGRESS JOURNAL

AMC

DECEMBER 1951

LINK-BELT engineering experience...

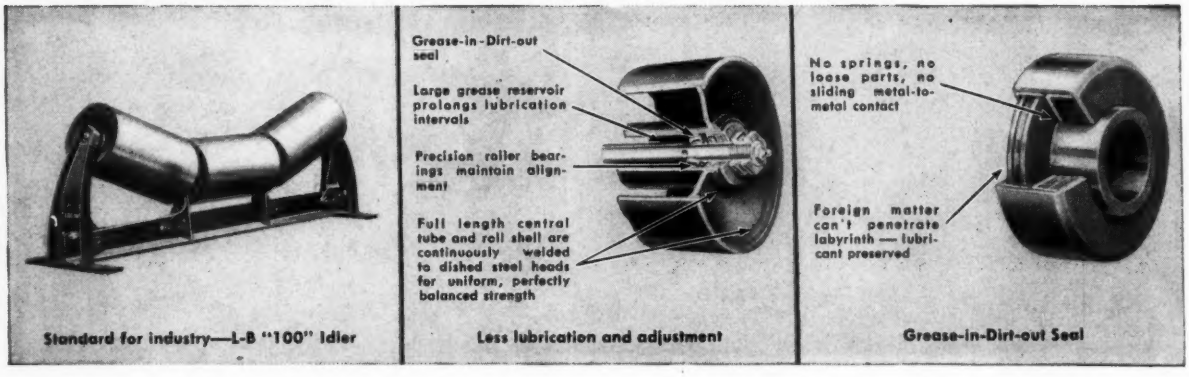




Nickel ore enroute to bin.

Overburden leaving iron ore pit.

plus LINK-BELT quality components...



add up to your best bet in BELT CONVEYORS

In mines all over the world, LINK-BELT Belt Conveyors provide reliable, efficient materials handling

Get the finest in modern materials handling in your mine. It can be as simple as calling in a Link-Belt engineer while you're still in the planning stage.

Thousands agree Link-Belt builds the finest belt conveyors on the market today. More, it has the most complete line of components — all types and sizes — idlers, take-ups, pulleys, trippers, bearings and power transmission drives. Plus all related equipment — other types of conveyors, feeders, elevators, car dumpers and shakers, weigh larries.

Equally important, Link-Belt Belt Conveyor engineers can draw on the broadest materials handling background in the industry. They'll work with you and your consultants — help you come up with the right system for your requirements.

Call on your representative, or write us direct for the services of a belt conveyor expert.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities.

12,247-A

Are You Prepared To Clean Up Falls As Fast As You Can Shift Cars?

Here the powerful Whaley "Automat" is cleaning up rock falls in a coal mine in the No. 8 seam in Eastern Ohio. Note the limited headroom. Yet, the "Automat" loads the cars to capacity because the exclusive parallel lift rear conveyor is always automatically parallel to top of car. Consequently it takes full advantage of limited headroom.

Suppose you have a heavy fall on your haulage road today. Are you prepared to clean it up as fast as you can shift cars? You would be with the Whaley "Automat"!

In addition to being a fast and dependable coal loader, the "Automat" has no equal when it comes to standing up under the wear and tear of rock work and loading consistently at full capacity.

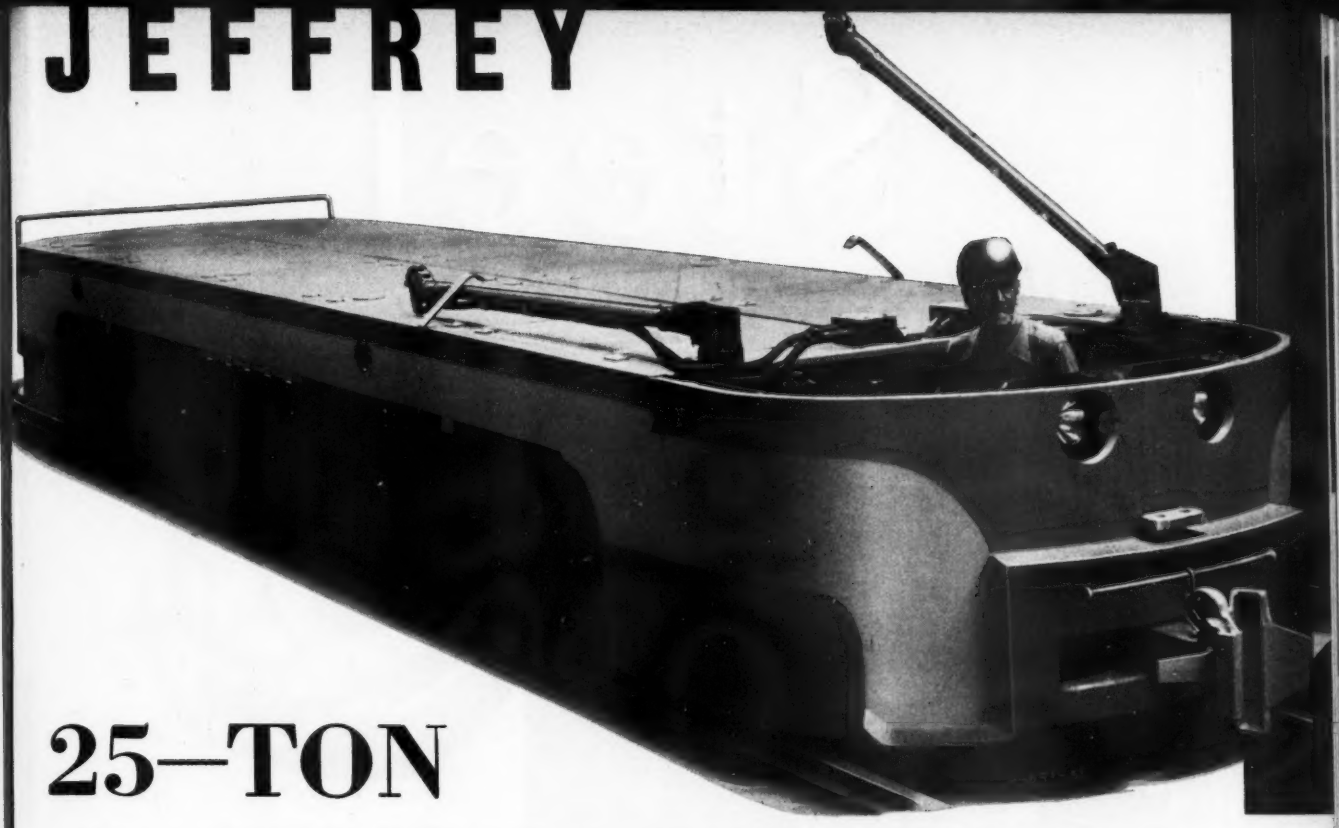
For your thin coal mines, where you have to take top or bottom rock in brushing haulageways, making grades, etc., you will find the "Automat" to be the fastest, most economical and dependable machine on the market. Many coal companies consider the "Automat" standard equipment for this class of work. Complete information will be furnished on request, including Catalog No. 250. Myers-Whaley Co., Knoxville, Tennessee.

MYERS-WHALEY

"MECHANICAL LOADERS EXCLUSIVELY FOR OVER 40 YEARS"


power plus!

JEFFREY



25—TON

(8-wheel) MAIN LINE LOCOMOTIVES

WITH THESE FEATURES:

- All-welded Frame
- Will Negotiate a 50-foot Radius Curve
- Four 80 H.P. Ventilated Motors (8 miles per hour)
  For 12 m.p.h. operation—120 H.P. motors available
- Full Electro-pneumatic Contactor Control with Dynamic Braking
- Straight Air Brakes
- Air Sanders for both directions on each truck
- Storage Battery operated Controls and Headlights
- Auxiliary Air Tank for operation of pneumatic contactors for emergency dynamic braking in case of power failure

The Jeffrey Manufacturing Company

958 North Fourth Street, Columbus 16, Ohio

District Offices

Baltimore 2	Buffalo 2	Denver 2	Houston 2	Philadelphia 3
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Jeffrey builds a complete line of Trolley and Storage Battery Locomotives for gathering or haulage. Send for details.

Service Stations

Birmingham—Pittsburgh—Johnstown—Forty Fort, Pa.—Mt. Vernon, Ill.—Harlan, Ky.
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The Ohio Malleable Iron Co., Columbus, Ohio
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio
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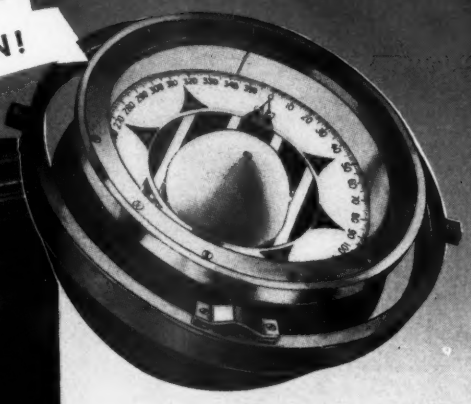
Steel

BULWARK OF FREEDOM, AND . . .

NAVIGATOR OF INDUSTRIAL MIGRATION!



BLOOMING THE INGOTS

Steel, like dough for bread, must be kneaded, rolled and worked from ingots weighing several tons down to many shapes and sizes. First in the series of such processes is the giant blooming mill of which Sheffield has installed the most modern type.

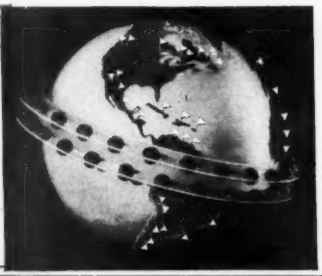
SINCE Colonial times industry has been on the move, migrating from the Northeast—West, Southwest—with iron and steel providing the means and in many cases, the motive.

West of the Mississippi and East of the Rockies, Sheffield Steel and its forebearer have successfully navigated the uncharted course of steel production since 1888. First, and still the only fully integrated steel mill operation in Mid-America, Sheffield continues to devote an ever-expanding production to a wide diversity of the particular kinds of steel products most needed in the industrial growth of the region.

Within the last ten years, the industrial growth of the region has shattered all records. So, too, has Sheffield Steel in expanding some of its facilities as much as 3½ times, and marking up an overall capacity increase, at its three plants, of over 100% as compared to 25% for the steel industry as a whole.

SHEFFIELD
STEEL
CORPORATION
HOUSTON KANSAS CITY
TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION

SHEFFIELD
MOLY-COP
COPPER-MOLYBDENUM ALLOY
Grinding Balls
USED and PROVED ALL AROUND THE WORLD



IRON AND STEEL *SCRAP* MEANS . . . . . .

MORE STEEL FOR AMERICA
More Money In Your Pocket!

GET YOURS OFF TO
THE DEFENSE LINES NOW!

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Contents

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THE AMERICAN MINING CONGRESS
1102 RING BLDG., WASHINGTON 6, D. C.

HOWARD I. YOUNG, *President* — WORTHEN BRADLEY, *Vice President* — ANDREW FLETCHER, *Vice President* — WILLIAM J. JENKINS, *Vice President* — JULIAN D. CONOVER, *Secretary*

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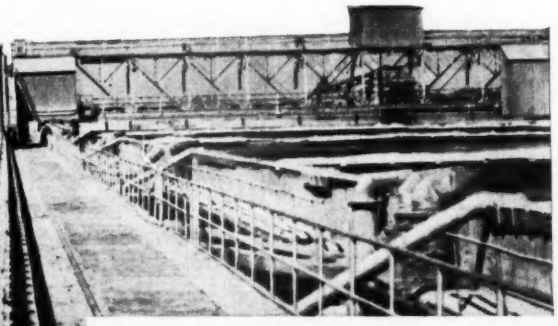
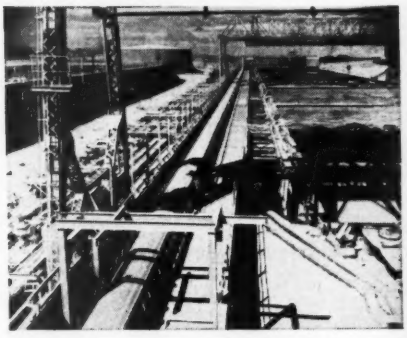
Member Audit Bureau of Circulation.

U. S. Rubber conveyor belt establishes a world's record



This record-breaking "U. S." belt carries a maximum of 5,000 tons of copper ore per hour, travels 600 f.p.m. through a traveling tripper. Total belt length is 2990 feet, width is 60", 42-ounce duck construction.



Twelve years' exposure to blistering tropical sun, one of rubber's worst enemies, has had little or no effect on the belt. It is located at the plant of the Chile Exploration Co., an Anaconda Copper subsidiary.

This U. S. Rubber conveyor belt in operation at a Chilean copper mine has carried over *100,000,000 tons* of abrasive copper ore . . . a world's record . . . at the amazingly low cost of less than *45¢ per 1,000 tons!* The belt has been in continuous service for over 12 years. The operators say there are still many more years of service in the belt, despite this record-breaking performance.

Such success as this results from 3-way engineering teamwork; mine operators, designers of conveyor equipment, and the United States Rubber Company belt engineers. For *your* haulage problem, large or small, call in a "U. S." engineer. Write to address below.

PRODUCT OF

U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

down come costs

These two P&H Electrics serve the same steel-making operation at Birmingham, Alabama. The Model 1600, owned by the Birmingham Slag Company, is loading blast furnace slag. The Model 1400, digging fluxing stone, is owned by the Stockbridge Stone Company.

with P&H ELECTRIC SHOVELS

Wherever these new P&H Electrics take over, costs go *down!* It couldn't be otherwise, with all the improvements that make for faster, smoother, more dependable digging.

There's Magnetorque* Hoist Drive, which gives you snappier dipper action with electro-magnetic power — completely eliminates hoist generator, hoist motor, slip friction clutch, and other mechanical devices.

There's P&H stepless power regulation — smoother, more accurate — and no control fingers or contactors to require maintenance or give you trouble.

There's tough, all-welded construction for extra strength without excess weight.

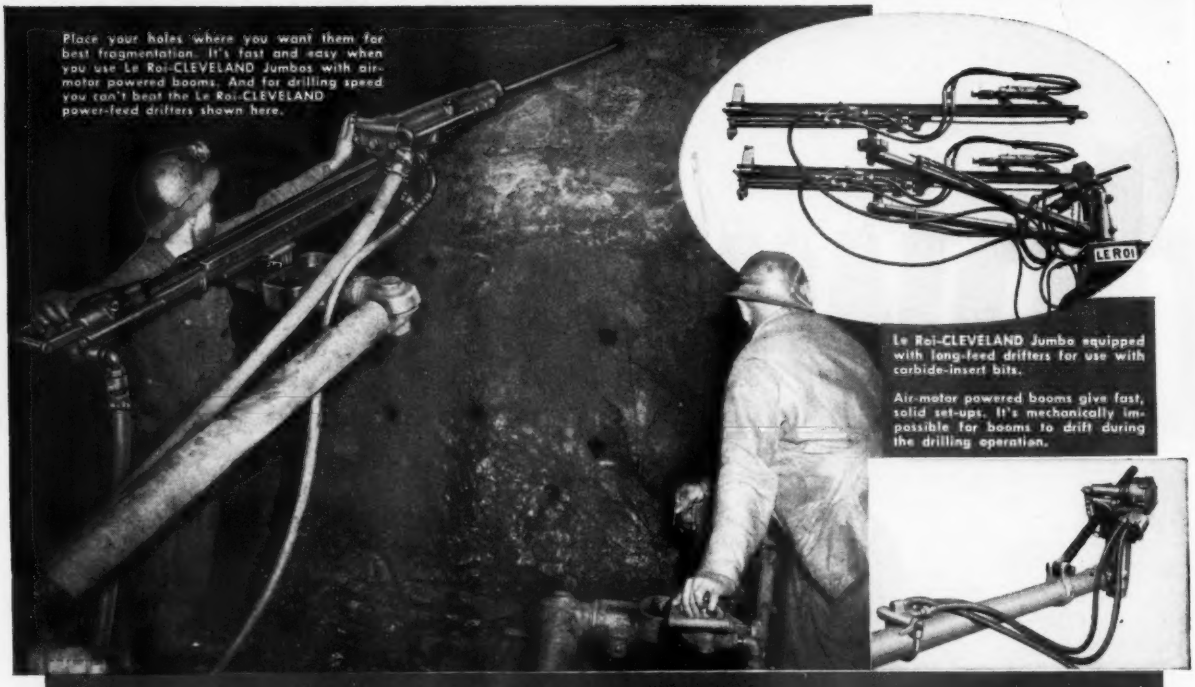
There's more — *much more* — see a P&H before you invest in new equipment of this type.

* Trade-mark of Harnischfeger Corporation for electro-magnetic type clutch.

P&H
ELECTRIC SHOVELS
4555 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER
CORPORATION

Every third P&H Electric Shovel sold is a repeat order

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FAB HOMES



Drilling-Cycle Time Reduced, Footage per Shift Increased

. . . when you use Le Roi-CLEVELAND Jumbos and power-feed drifters in your rock headings

THERE are three things you have to do if you want to save time in your drilling cycle and increase your footage — reduce set-up time, drill out the round faster, and shorten tear-down time.

You know this and so do we. That's why we designed the Le Roi-CLEVELAND jumbo the way it is. And that's also why our drifters drill so fast.

Let's see what you get when you use Le Roi-CLEVELAND:

★ The most flexible jumbo available. Air-motor powered booms let you space your holes quickly and easily for most efficient fragmentation.

★ Rigid, non-slip set-up feature keeps drifters in line, prevents steel binding, saves wear and tear on chucks, results in higher average drilling speeds.

★ Strong rotation, plus snappy yet powerful force of blow of Le Roi-CLEVELAND drifters gives you unexcelled drilling speed. This drilling speed coupled with the fast, positive feeding action of our power feed gives you the right pressure for fastest drilling and reduces drill-steel changing time.

You add all these advantages together when you use Le Roi-CLEVELAND jumbos and power-feed drifters. The outcome is faster drilling cycles, more footage per shift—so why not standardize on these cost-cutting honeys. Write for complete information.

LE ROI COMPANY RD-42

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
***Plants:* Milwaukee, Cleveland and Greenwich, Ohio**

BY THE YARD..

OR BY THE TON..

"EUCS"

Haul More Loads at Less Cost!

Leading contractors and industrial users buy Euclids because they are job proved for high production at the lowest cost per ton or yard moved . . . and because "Eucs" are designed and built throughout for long, efficient service in open pit mines and quarries, heavy construction and industrial work.

There is a Euclid model to meet every requirement in off-the-highway work . . . and body designs for all types of materials. Their rugged strength and stamina have made "Eucs" the standard hauling equipment of many leading operators. The Euclid Loader is built to match the speed and efficiency of other Euclid earth moving equipment. It is designed for use with the Euclid Bottom-Dump and other large capacity hauling units, and provides fast, mobile loading of practically any material.

Euclid's world-wide distributor organization assures fast, efficient service to all owners. Write for complete information on the Euclid models best suited to your job requirements and plan now to move more loads per hour at more profit per load with "Eucs" on your future off-the-highway work.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLID

In the JOY FA CHAIN CONVEYOR you get the advantages of COMPLETELY NEW DESIGN

Built in 12", 15" and 20" Widths

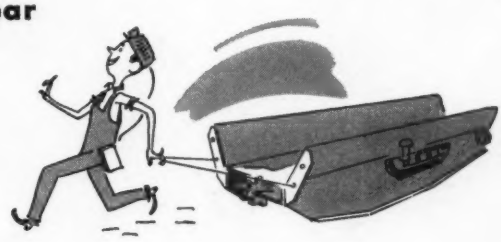
Simple V-Belt Drive

No troublesome flexible coupling to line up, service and maintain.

Integral Speed Reducer saves 500 lbs.

Highly efficient helical and spur gear reducer. Tucked away under the trough and protected.

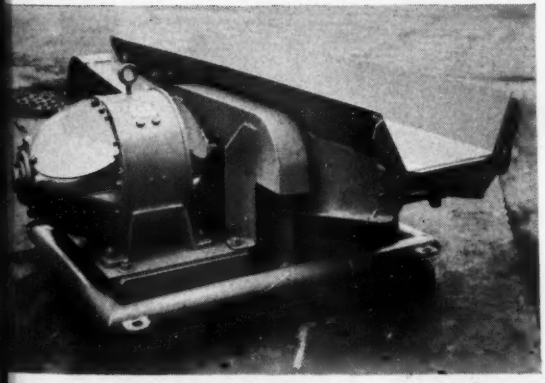
This section easy to handle and move...when removed from base, it's on its own skids.



Easy to Reverse-and in far less time

Much simpler operation. Far fewer parts to handle and less man-hours required.

Requires 4 sq. ft. less floor space



For complete information on the Joy FA Chain Conveyor, write for Bulletin LD-200

Can be used in more restricted areas. More compact, easier to install, requires less level foundation space.

Consult a Joy Engineer

WAD CL 3748

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

One of These
MUSCLE MEN...

AIRDOX

—the non-shattering force of compressed air

CARDOX

—the powerful expansion of released Carbon Dioxide

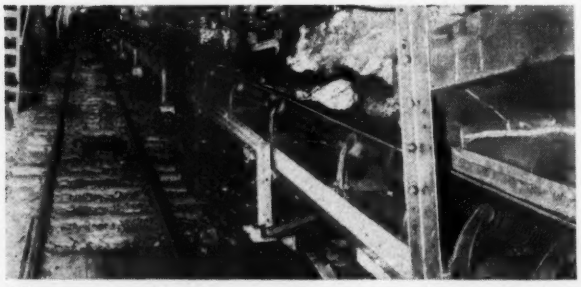
Will Show You How
To Get **MORE COAL**
Out of Your Mine

● **The Cardox-Hardsocg Auger-Miner will salvage countless tons of coal where stripping was halted because over-burden became too costly to remove. Augers 20 to 40 inches in diameter draw the coal in a continuous flow from the seam. See in the picture how addition of a portable conveyor makes this a continuous operation, loading into trucks or cars automatically.**

For heavy-duty conveyors...

IT'S TIMKEN®...

This 295-foot conveyor has been transporting soybeans since 1940. Timken roller bearings in the Continental Gin Company Idlers assure long life with minimum maintenance.



These Rex troughing idlers equipped with Timken bearings have already seen grueling service on the world's longest conveyor that helped build Shasta Dam. They're still on the go—this time hauling coal.

AND TIMKEN...

One of four 860-foot limestone storage conveyors with travelling stackers and 79-foot wing conveyors. Built by Stephens-Adamson Manufacturing Company and in service since 1930, the stackers' idlers are Timken bearing equipped for trouble-free operation.

AND TIMKEN AGAIN!

AND HERE ARE 6 BIG REASONS WHY:

1 **THOROUGHLY PROVED.** The Timken® bearing is the only tapered roller bearing proved by 15 years or more of service in heavy-duty conveyor installations using the popular dead shaft construction.

2 **EXTRA CAPACITY.** Line contact between rollers and races gives Timken bearings high load capacity. And by using Timken bearing sizes that are mass produced for the automotive industry you get extra capacity bearings that actually cost *less* than the smaller sizes you'd normally use.

3 **LONG-LIFE LUBRICATION.** Not just lubricated for "life" but lubricated yearly or as conditions require to insure *long* life. Fresh lubricant ends gummy, sticky, jammed bearings.

4 **LONGER ROLLER AND BELT LIFE.** Less sliding and scuffing between idlers and belt.

5 **FRICTION MINIMIZED.** Timken bearings' true rolling motion and extremely smooth surface finish practically eliminate friction.

6 **MAINTENANCE REDUCED.** Long life and dependable performance of Timken tapered roller bearings cut maintenance to a minimum.

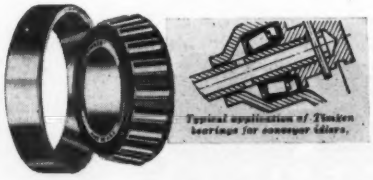
Remember "Timken" is not a bearing type. It is a trade-mark applying only to bearings made by The Timken Roller Bearing Company. Always insist on Timken bearings for the conveyors you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Wherever the going's tough industry turns to

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



Typical application of Timken bearings for conveyor idlers.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION ✳

CUT A MILE OFF YOUR HAULING TIME!

It's true! A.C.F. Drop Bottom Mine Cars save *at least* as much time as your trips now use to cover the last mile of hauling.

In many mines, the time savings add up high enough to let each trip of cars make an extra round trip a day—a *big* production bonus!

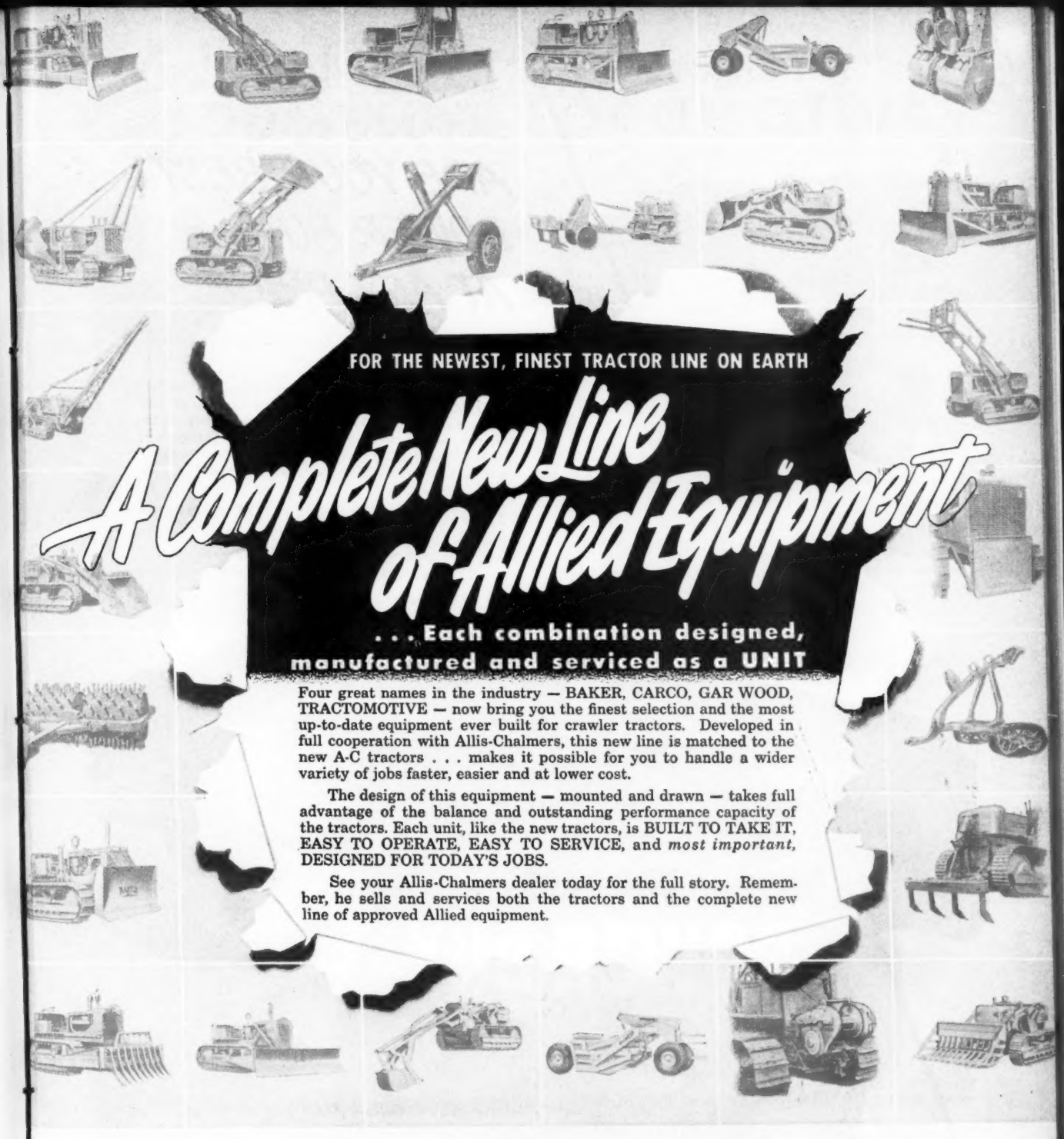
Here's how it's done. Instead of spending the usual 5, 10 or even 15 minutes unloading, a trip of fifteen A.C.F. Drop Bottom Mine Cars is empty, ready to return for more coal, in *75 seconds flat!*

Faster than you can tell about it, each car trips, empties, and latches—*automatically, on the move.* In many mines, the time-savings permit *an extra load of coal for every trip of cars—on every shift!*

Your nearby A.C.F. Representative can give you facts and figures that show just how much time you can save—how much extra tonnage you can produce—with A.C.F. Drop Bottom Mine Cars. American Car and Foundry Company, New York • Chicago • St. Louis • Cleveland • Philadelphia • Washington • Huntington, W. Va. • San Francisco • Berwick, Pa.

a.C.f. **MINE CARS**

for Constant Haulage



FOR THE NEWEST, FINEST TRACTOR LINE ON EARTH

A Complete New Line of Allied Equipment

. . . Each combination designed, manufactured and serviced as a UNIT

Four great names in the industry — BAKER, CARCO, GAR WOOD, TRACTOMOTIVE — now bring you the finest selection and the most up-to-date equipment ever built for crawler tractors. Developed in full cooperation with Allis-Chalmers, this new line is matched to the new A-C tractors . . . makes it possible for you to handle a wider variety of jobs faster, easier and at lower cost.

The design of this equipment — mounted and drawn — takes full advantage of the balance and outstanding performance capacity of the tractors. Each unit, like the new tractors, is BUILT TO TAKE IT, EASY TO OPERATE, EASY TO SERVICE, and *most important,* DESIGNED FOR TODAY'S JOBS.

See your Allis-Chalmers dealer today for the full story. Remember, he sells and services both the tractors and the complete new line of approved Allied equipment.

Years Ahead

Each of the new Allis-Chalmers crawlers provides a new yardstick for rating tractors. Each sets new standards for performance, strength, servicing, operation.

HD-5	40.26 drawbar hp.; 11,250 lb.
HD-9	72 drawbar hp.; 18,800 lb.
HD-15	109 drawbar hp.; 27,850 lb.
HD-20	175 net engine hp.; 41,000 lb. Hydraulic Torque Converter Drive

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Exide-Ironclad
BATTERIES

ARE YOUR BEST POWER BUY— AT ANY PRICE

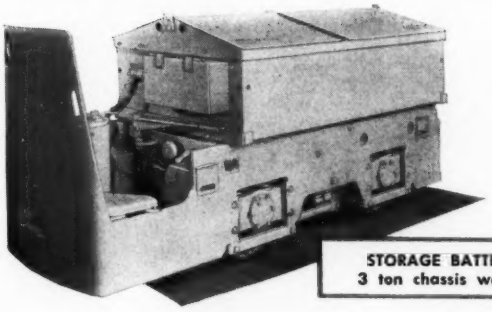
They PROVIDE ample power for fast, high-production haulage—more trips per shift, dependable round-the-clock performance, with no end-of-shift slowdown, no unscheduled down time . . . ASSURE inherent safety, with freedom from hazards of fire, fumes, noise . . . SHOW low costs of operation, maintenance, repair, depreciation. SIZES for all makes of battery-powered mine locomotives, trammers, shuttle cars. Call in an Exide Representative and let him prove these facts.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2

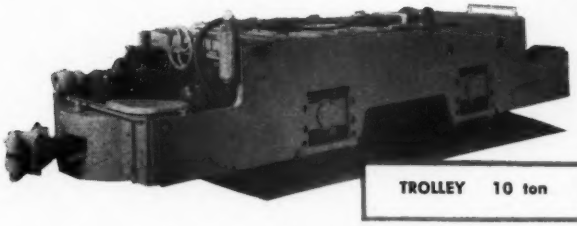
Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

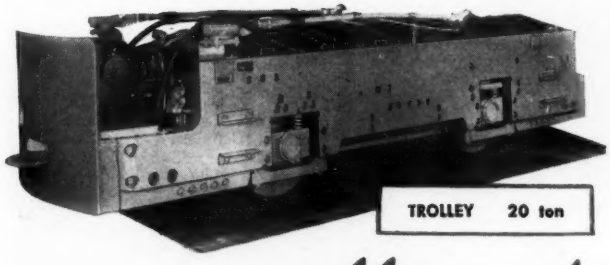
Goodman METAL MINE LOCOMOTIVES



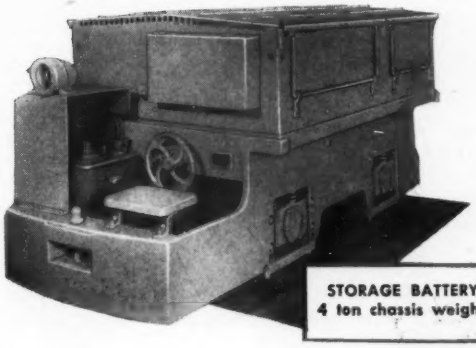
STORAGE BATTERY
3 ton chassis weight



TROLLEY 10 ton



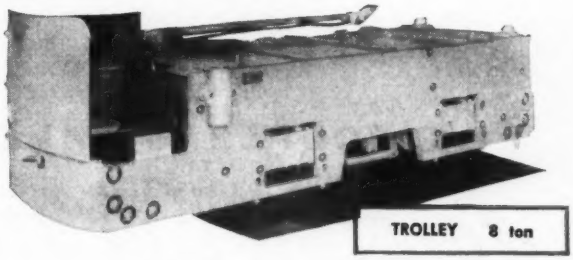
TROLLEY 20 ton



STORAGE BATTERY
4 ton chassis weight

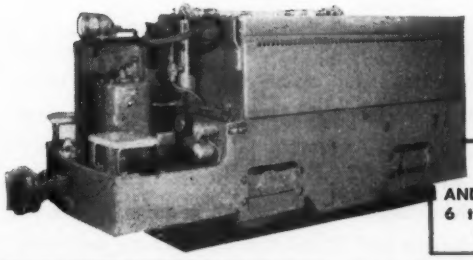
...all profitably in service

TROLLEY 6 ton



TROLLEY 8 ton

TROLLEY-REEL 8 ton



STORAGE BATTERY AND TROLLEY
6 ton chassis weight

There is a Goodman type of locomotive to fit any underground operation. Your inquiry is invited.

Goodman MANUFACTURING COMPANY

HALSTED STREET at 48th • CHICAGO 9, ILLINOIS

Builders of Coal Mine, Metal Mine and Tunneling Machinery For More Than Fifty Years

When the heads come together, the spring-loaded cam rises (dotted lines) and then falls to lock the two heads securely, rigidly

O-B COUPLERS SAVE TIME AND WORK BY

Joining Securely on Impact

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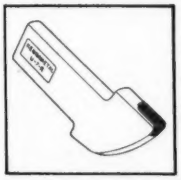
Mack Model A-40S six-wheeler has won outstanding recognition in strip mining operations as a rugged, dependable dump truck.

New Machine Bit Developed for Severe Cutting Conditions



A new cutter bit, Style UR, is being manufactured by Kennametal Inc., Latrobe, Pa. Bit is designed for faster cutting where shock conditions are severe, such as in the Continuous Miner, and in seams having large amounts of rock and other hard impurities. Features of the new UR Bit are its hard insert of Kennametal tungsten-carbide, and a special shank design that holds the insert firmly on four surfaces. Performance to date shows reduced cutting costs in rugged, rock-laminated seams.

●

Hollow Drill Rod For Roof Pinning

Hollow drill steels have been adapted by Kennametal engineers for use in the wet drilling of roof bolt holes. A square hole is formed at the end of the rod to accommodate the Kennametal HFD Bit. The bit has been adapted for wet drilling by grooving two sides of the shank to afford a passage for water. The advantage of water, besides controlling silica dust, is increased bit life.

●

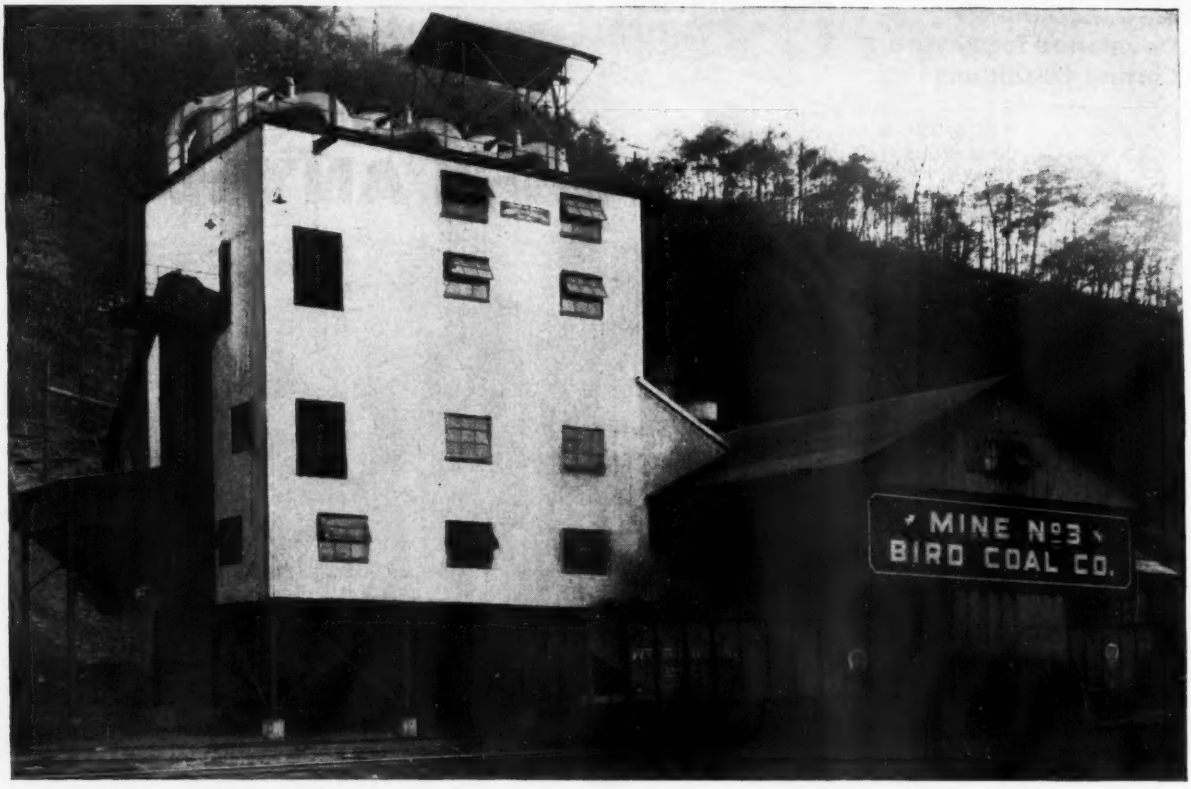
Coal Company Reduces Bit Cost 50 Percent

Peters Creek Coal Company Superintendent, James Savilla, reports that bit cost over a base period of two months has been reduced approximately 50% by changing from steel to Kennametal. The cost reported was $187 for the use of steel, $92.50 over the same period using Kennametal. Other advantages in speed, and ability to drill rock were cited.

●

Ivan J. (Dutch) Kinter Joins Kennametal Sales and Service

With the appointment of Ivan J. (Dutch) Kinter, effective July 1, as a Kennametal sales and service representative, Kennametal has representation in all of the major coal and non-metallic mineral producing centers of the United States. Mr. Kinter's territory will include eastern and southern Colorado, New Mexico, and Arizona. His headquarters will be in Carlsbad, N. M.



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Engineering and construction of the plant as well as the manufacture of the Super-Airflow units was by Roberts and Schaefer Company.

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Mining CONGRESS JOURNAL

Published for the Entire Mining Industry
by the AMERICAN MINING CONGRESS
JOHN C. FOX, Editor

VOLUME 37 DECEMBER, 1951 NUMBER 12

Mites Make Right

IN a recent issue of a popular picture magazine a feature article called attention to the excellent job being done by the U. S. Public Health Service in studying stream pollution due to sewage. This work reflects just one aspect of a nation-wide preoccupation with our drainage systems. In an almost hysterical rush to clean up our rivers, lakes and streams, a number of punitive laws have been passed with no exact knowledge of what really constitutes a pollution problem and no regard for the economics involved in a workable solution.

Only painstaking, continuous gathering of data coupled with equally careful analysis and study can produce an appreciation of what the problems really are. Having defined the problems, it still remains to determine the best ways to deal with them.

Progressive coal mining companies in the Ohio River Drainage Basin were among the first to recognize the importance of research and study. To this end they lent their wholehearted support to cooperative efforts along these lines. As a result, great progress has been made in dealing with the suspended solids formerly found in the effluents from coal cleaning plants. The American Mining Congress Committee on Sludge Recovery has described fully the elaborate systems installed in modern coal washeries to prevent the discharge of solids into streams. In some cases the recovery of these solids has resulted in a commercial profit.

Another highly important phase of the program is a study of the effects of acid mine water. This problem is more difficult to define and as yet no practical solution is in sight. The Mellon Institute has been working for years running down every possible clue that might shed some light on the problem.

To neutralize the acid water in our streams through addition of lime is not practicable; for example, all the limestone produced in Pennsylvania in one year would be needed to neutralize the acid in the Monongahela River alone. Even if this could be done, the resultant precipitate would pose another serious problem.

Support for the Institute's work has come partly from private contributions and partly from the State of Pennsylvania. For the coming year, the State finds it necessary to curtail its financial support. Deprived of this aid, the whole project threatens to grind to a halt. Even a short cessation of activity would nullify all the time and effort expended so far and force a fresh start.

To assure the uninterrupted prosecution of this project, immediate financial support from the coal mining industry is essential. Fair and reasonable consideration of a situation so often approached from an emotional angle demands facts and figures. These must come, carefully weighed and documented, from an unimpeachable authority. The Mellon Institute is such an authority and its program ensures complete, well-marshalled data. Every dollar contributed to support of its investigations will be returned many times in the value of the benefits derived from them.

Every mite contributed pays for uncovering a few more facts and brings an equitable solution of the acid mine water problem a step closer.

We Dare Not Leave Well Enough Alone

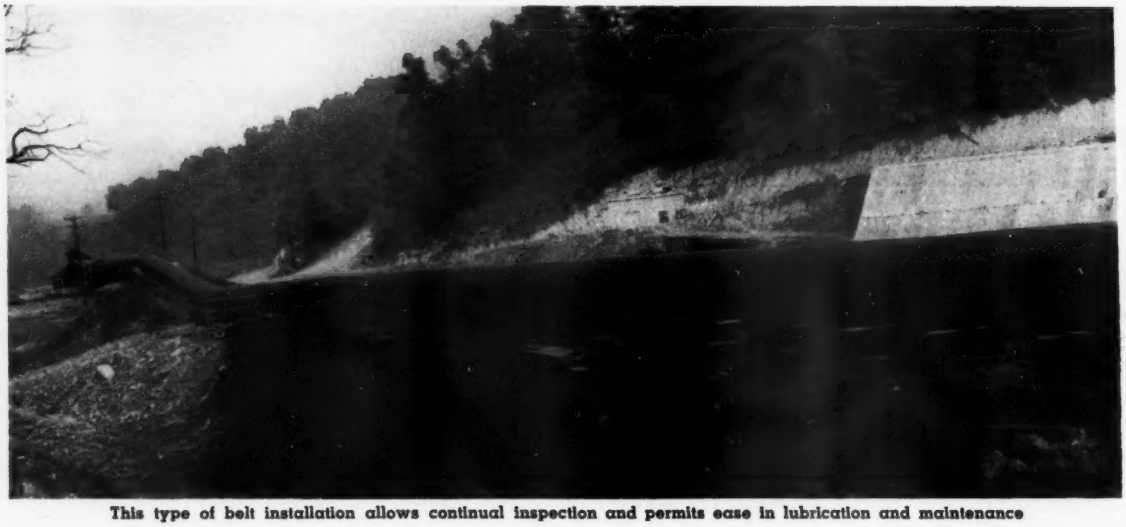
AS the year 1951 draws to a close it is time to take stock of our accomplishments and shortcomings during this period.

A good part of this issue is devoted to the proceedings at the 1951 Metal and Nonmetallic Mineral Mining Convention, held in Los Angeles October 22-24. There, nine sessions and a number of special conferences were devoted to just such an inventory. There is no room on this page to recapitulate all the information given and conclusions drawn. That can be discovered in the abstracts of the addresses and the Convention Story beginning on page 36.

Let it suffice to say here that tremendous strides have been made along the road toward strengthening our nation—come war or come peace. But we dare not leave well enough alone. Copper, lead and zinc as well as many of the most strategic metals and minerals are still in short supply. It behooves the Mining Industry to do its utmost to increase their production.

The more than 2000 operating men who attended the convention heard how many of their colleagues are progressing toward that goal. They have returned to their mines and mills with many new ideas and a fuller conception of the problems the mineral agencies of Government are facing in their efforts to help the industry do the job.

The delegates were told, straight from the shoulder, that DMPA, DMA, the U. S. Bureau of Mines and the U. S. Geological Survey and other agencies, old and new, are determined to help to the fullest extent. But realizing that America's strength lies in its Free Enterprise system, they are equally determined to refrain from telling the mining men of the nation just how to do the job. That is left to the industry itself, with full confidence in American ingenuity and know-how.



This type of belt installation allows continual inspection and permits ease in lubrication and maintenance

A Modern Mechanical Coal Mine

National Mines Corp. Has Overcome Difficult Physical Conditions by the Use of Modern Equipment, Combined With Some Original Ideas

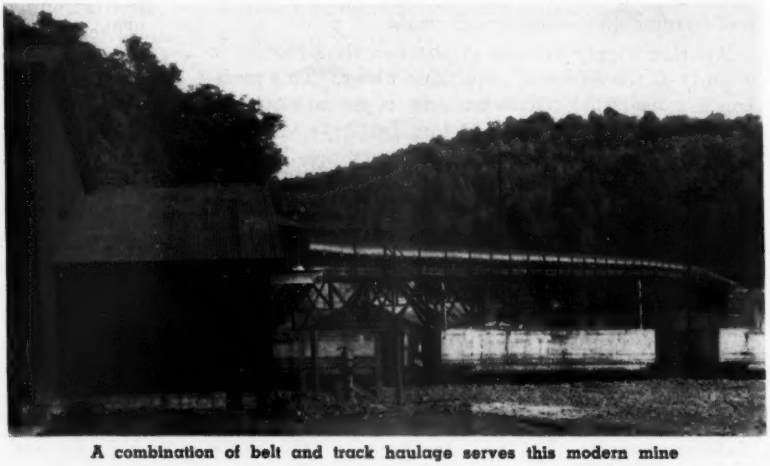
By C. W. THOMPSON,
Manager
National Mines Corp.

THE Weirton mine of National Mines Corp., located in northern West Virginia, is an example of how modern equipment, combined with some original planning a step or two in advance of proven methods, has been applied to operate a coal territory that was not amenable to conventional mining plans. The coal—the upper Freeport—is a high-grade metallurgical fuel and the demand for its use in steel manufacture made it necessary to open and develop the property. Accounts of plant construction, started in 1949, and the subsequent early development of the mine were published in MINING CONGRESS JOURNAL *; the present article continues the story by describing some of the underground operations.

Transportation Problem

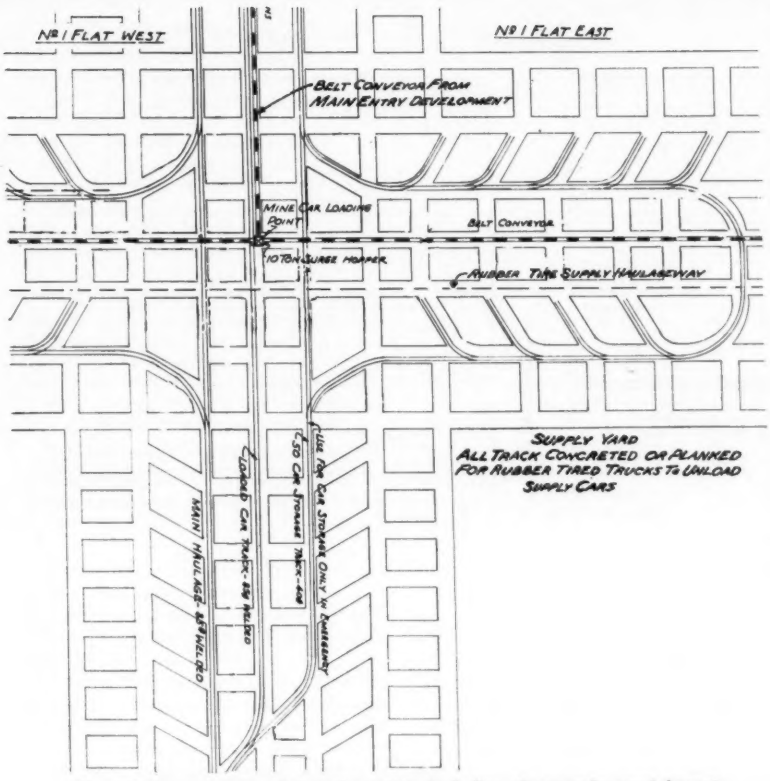
Plans for mining this property were under discussion and in preparation for several years before the first construction was started. The major problem was early recognized as being the basic problem of all coal mining—transportation. Loading the coal out of the seam, hauling it from the face to the preparation plant and from there delivering it to the medium which will take it to market, all involve movement. There was no immediate or obvious answer to any phase of this three-fold problem; in fact, a combination of some difficult physical conditions and high labor rates made it immediately obvious that traditional methods of mining and haulage would not serve and that practicable, economical operation required the use of the most modern equipment and techniques. In addition it was further realized that it would be necessary to go beyond even recently developed practice and do some pioneering.

In building the plant, the last phase of the problem came first; that is, the matter of providing a means of transportation from the preparation plant



A combination of belt and track haulage serves this modern mine

* MCJ; November, 1949, pp. 29-33.
MCJ; November, 1950, pp. 27-29 and 68.



Plan of the underground transfer points including the supply yard layout

to the rail and river tipple—a direct distance of two miles or four miles by outside track haulage. The decision was made in favor of the shorter route and was accomplished by a tunnel equipped with a belt conveyor. The unique feature in this installation was that a belt, two miles long from head to tail pulley, was driven with a single drive. This was truly pioneering as 2000 to 2500 ft was at that time considered to be the maximum length for an underground belt. The fact that the tunnel conveyor has operated steadily for a year and a half and has hauled 850,000 tons of coal a distance of two miles without any major breakdown or replacement, is convincing proof that the design was correct.

Haul on Track and Belt

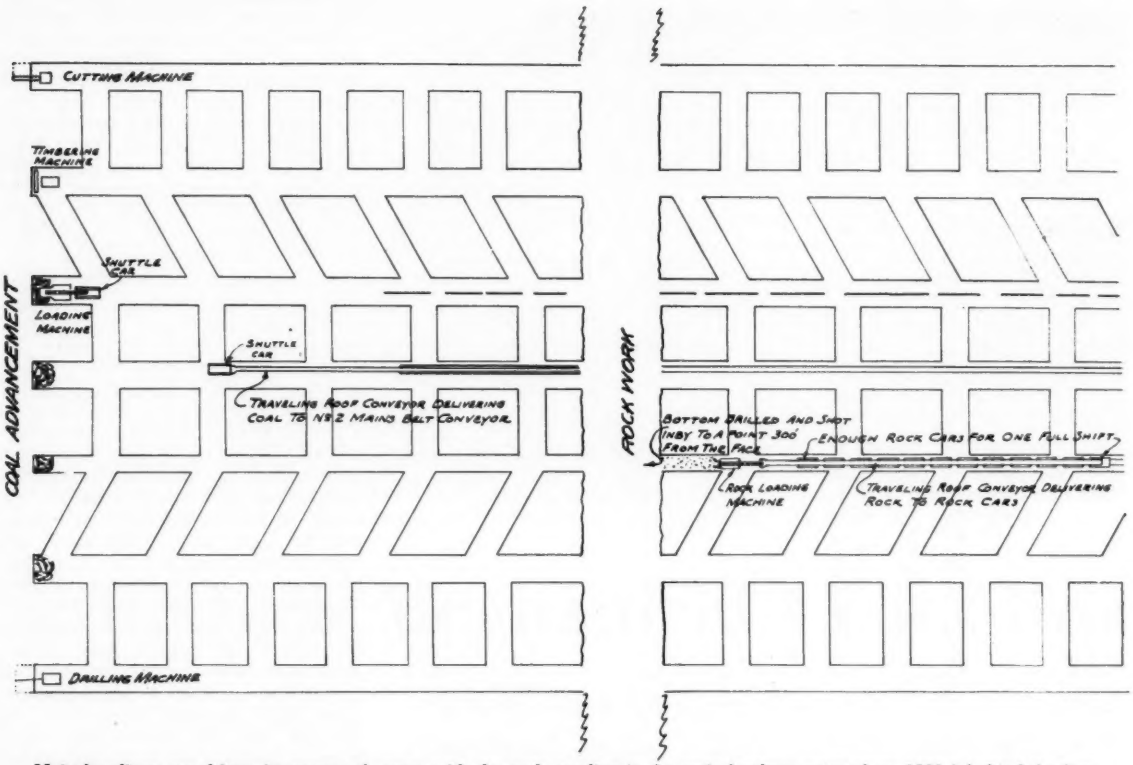
The second transportation problem, that of getting coal from the working sections to the preparation plant, was made more difficult by several different conditions. It was the original intention that the mine transportation system would be a combination track and belt haulage; track for main line with belts from there to the working sections. This plan is basically unchanged and is being installed in the main body of the property. However, there are several smaller areas of coal, adjacent to, but not a part of the main body that were opened for immediate tonnage. Coal from these areas comes to the preparation plant by belt conveyor. These mines could have been served by tram roads from their portals to the main dump bin but investigation showed that outside belt lines were feasible and could be installed and operated at lower cost than rail haulage. This was largely because conveyors can be laid in a direct line across country at a considerable saving in distance compared to hillside tram roads. Coal from these two adjacent areas, designated as Mines No. 2 and No. 3, now makes up a large proportion of the output while the main entries of No. 1 mine are under development.

The outside belts are 30 and 42 in. wide, and run at a speed of 300 fpm with a capacity of 300 and 600 tph, respectively. Their installation is adequate but not elaborate. Closed galleries were not constructed; the conveyors are for the most part on dirt fills except where trestles are needed to cross creeks and roads. The gradient follows the ground with easy vertical curves where necessary. The roller standards are on heavy wood bearing blocks set on the earth fill. The conveyor itself is covered; a semicircular section of corrugated iron pipe forms the roof and flat corrugated sheets are used for siding—but only on the "weather side." There is no covered walkway. This type of installation provides a means for adequate and continual inspection, lubrication and any maintenance that may be needed. At the discharge end of the belt, the approach to the preparation plant is carried on a steel trestle.

Use Seven-Entry System

The main heading for No. 1 mine, which will work the main body of the property, has seven entries. Three of

Suspended conveyor allows a trip of empty cars to be placed under the loading machine boom



Main headings are driven in groups of seven with the rock grading in the main haulage entry about 1500 ft behind the face

these are used for the main line track, runarounds and loading stations where the East and West panel belts discharge into mine cars. The two outside entries are intake airways with the return air carried in No. 1 and No. 3 mains. This development was planned for long life operation of the property, giving adequate pillar protection for the haulages and airways. Room work starts beyond the barrier pillars, with the panels mined retreating. Belt conveyors are used in room, and main panel entries.

The track loading station, where the belts discharge into the mine cars, is entirely automatic. A trip of mine cars is placed at the station by the locomotive and from that time on, until the trip is loaded, the station has no manual operation and requires no attention. A system of electric controls act automatically to move a car forward as it is being loaded, to stop the belt between mine cars so that there is no spillage and to start the belt when the next car is in position. This system, which was designed and originated at this mine, has been described previously and has also been duplicated at other mines since the original installation here two years ago.

Main line haulage is thoroughly modern in equipment, operation and track construction. The track is 85-lb rail, with welded joints, laid on wood ties and ballasted with crushed limestone. Twelve-ton locomotives and 15-ton steel mine cars are used on the main line—these cars are eight wheeled with solid body for rotary dumping and equipped with automatic couplers. In order to insure a high operating capacity main line track is being laid to an easy grade by taking top or bottom as required.

The real feature of the haulage is the track arrangement at the car loading station. The projected design may seem rather elaborate, but it is

Discharge end of a suspended conveyor

planned to serve a high tonnage surge from belt to track, providing for a flow of coal to the outside and supplies to the inside without interference or delay to either phase; and to do this with a minimum of manpower.

Supplies are brought from the surface to the underground supply yard in mine cars, where they are transferred to rubber tired haulage equipment and taken to the working sections over roads paralleling the conveyors. The mine floor in the supply yard is planked or concreted between the rails to allow the tractor trailer units free movement and provide a larger area in which to maneuver.

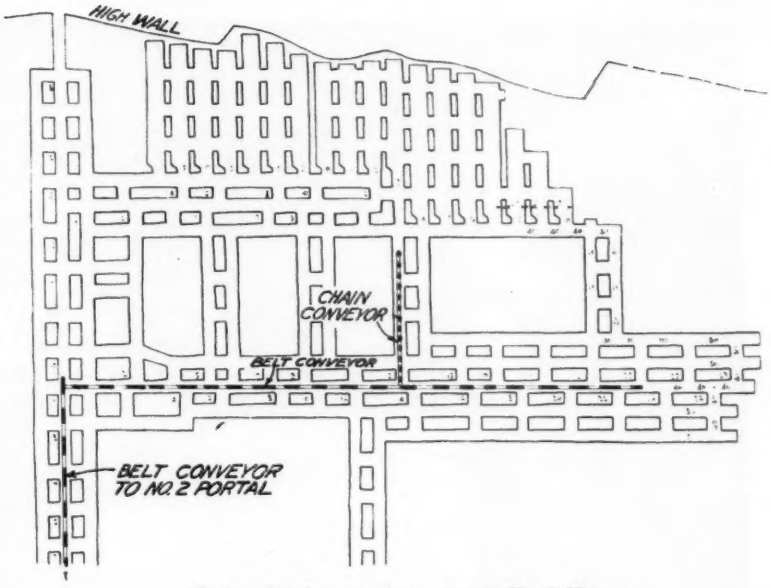
Grade Haulage Road

Average seam thickness is 42 in. but in this area there are variations in height as well as rolls or dips which make roof and bottom cuts necessary at times.

Main headings consist of seven entries. The entry driving in the coal is done with conventional loading machines and shuttle cars delivering to a gathering belt.

Car loading points are to be established at about 4000-ft intervals which allows track work ahead of the last loading point without interference with main haulage operation or belt conveyor. Experience has indicated that the main entries should be driven a considerable distance ahead of the rock grading to facilitate laying out proper profiles for the track haulageway. This also permits track work to advance at the same rate that the entries are being driven in the coal.

Rock is drilled and shot in the conventional manner and loaded with a mechanical loader. The mine cars, 23 ft long bumper to bumper, are difficult to load from end to end with a standard machine. To overcome this difficulty, and to eliminate car changes, a special type of belt conveyor was designed to handle rock from the machine and load it into the mine cars. This unit is suspended from roof hangers above the track, so that a trip of cars can be placed underneath. As each car is loaded, it is pulled ahead. The complete belt, with drive section, is mounted in a steel frame which in turn is suspended from rollers operating in a channel track suspended from the roof. The receiving end is lowered to the track level so that the boom of the loading machine can discharge into it. The whole unit is moved ahead by the loading machine as it advances. This device works very effectively and eliminates the need for track switches, turnouts or car changes during the shift as a trip of ten cars can be placed at one time.



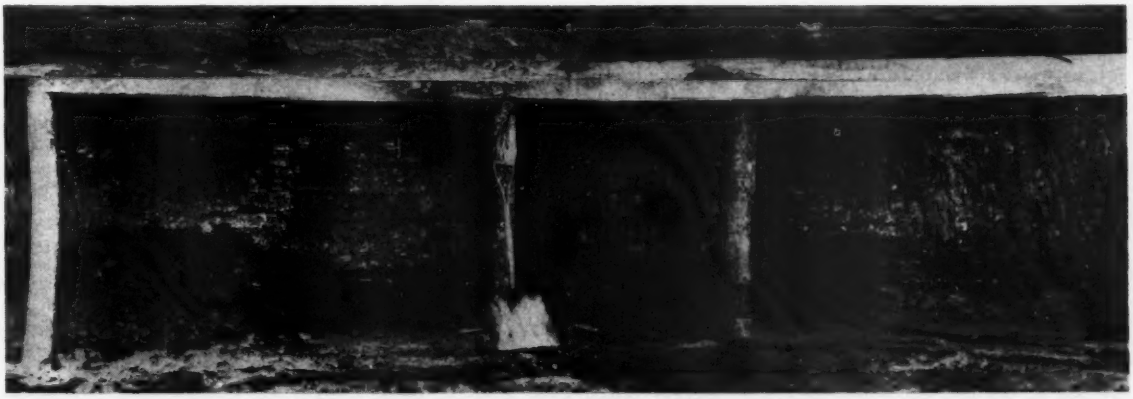
Mining plan for an outcrop area in No. 2 Mine

Gather With Chain Conveyor

Mining is by the room and pillar system. The coal is cut, drilled and shot down in the conventional manner and loaded by machines into shuttle cars. The shuttles deliver directly to the entry belt in the heading development. In room work a chain conveyor is used for gathering to shorten the shuttle haul. This reduces the shuttle tramming distance to the room length and enables one shuttle to serve the loading machine.

In No. 2 Mine eight rooms comprise an operating unit worked by one loading machine. However, to concentrate the tonnage, rooms are driven right and left off the entry so that two units are operating at one time, with both shuttles discharging on to the chain conveyor. The rooms are driven 30 ft wide and 180 ft long.

In order to eliminate any production delay, development work is kept one panel ahead and a chain conveyor is laid in the room entry so that when the outby panel is completed, the cutting and loading machines can proceed directly to the new panel without any production loss.



Favorable seam conditions simplify the face operations

Large well equipped underground shops help keep mechanical equipment in tip-top shape

Mechanical Mining in Nonmetallic Mines

Introduction of Labor Saving Machines Pays Dividends in Higher Production Rates, Lower Unit Cost

By H. L. GARDNER

Mine Engineer
International Minerals & Chemical Corp.

UNDERGROUND nonmetallic mines lend themselves most readily to modern mechanical mining methods. The average nonmetallic mine, whether it produces asbestos, boron, gypsum, limestone, oil shale, potash, salt or trona, is usually flat lying and the thickness of the deposit is sufficient to permit the use of many labor-saving, mechanical devices.

At one large, western, nonmetallic mine, the management calculates, with the present cost of labor, that on a three-shift basis it costs $20,000 per year for labor, to fill one job. Thus, if the installation of a certain piece of equipment will eliminate even a part of the labor required to do one job, the resultant savings will pay for the cost of the new equipment.

It has been said that a good big man can beat a good little man, and mechanically speaking, the trend today is to install larger and larger mechanical units in the underground mines, of the International Minerals & Chemical Corp., even though they cost more money and add to maintenance problems. Where access to a mine is by shaft rather than by adit, the very problem of getting the unit down the shaft and into the mine is increasingly more difficult. The mutilation to which a new shuttle car is subjected at the shaft collar before it can be lowered down the shaft is sad to see. This is one of the reasons for the trend toward large and well-equipped, self-sufficient underground shops and warehouses.

Larger mines have already begun to staff their underground operations with mechanical and electrical engineers. This practice will no doubt increase with the passage of time.

Among present day operations, the potash mines of southeast New Mexico rank over the leaders in mechanized mining. These mines, which are reached by vertical shafts approximately 900 ft deep, use the room and pillar method of mining. The face of the ore is first undercut by conventional cutting machines. Some 40 to 60 holes, depending upon the thickness of the ore, are then drilled by electric-powered, auger-type drills. These holes are blasted and the broken ore is loaded mechanically into rubber-tired shuttle cars. Potash, although it is mined somewhat like coal, is much tougher and weighs almost twice as much.

Use Diesels Underground

Mechanical mining has progressed far in these mines during the last ten years. The scraper, loading into a mine car, is a thing of the past. Undercutter bits and drill bits are now tipped with tungsten carbide inserts while the loaders crawler mounted on are self-propelled. Shuttle cars are supplied with power by storage batteries or cable, and diesel-powered equipment has entered the underground picture. Underground belt conveyors have been installed and at the present time, both a continuous mining machine and a self-propelled drill jumbo are in use.

At one potash mine, the average number of feet cut per cutting

machine shift increased from 119 in 1942 to 147 in 1950, an increase of 24 percent. The number of holes drilled per drill operator increased from 43 to 50, an increase of 16 percent. These increases were due to experience, better scheduling of operations, and to the use of tungsten carbide bits.

Both low and standard height loading machines and shuttle cars are used. The low-height machines handle up to 450 tons per shift while the standard machines are capable of handling almost 600 tons. Two or three shuttle cars work behind each loader, depending upon the length of the haul.

Diesel-powered bulldozers are now employed underground in some of the potash mines. They have proven their worth on track work, general clean-up, salt gobbing and the moving of heavy equipment. The development of diesel-powered locomotives and shuttle cars is being watched with keen interest.

New Equipment Ordered

One potash mine has on order for late 1952 delivery, a 40-ton diesel-electric mine locomotive. The maximum permissible speed of this unit is 30 mph and the track gauge is 42 in. The length over the truck end frames is 46 ft 4 in.; over-all height is six ft, and the width is seven ft. This locomotive can haul 668 tons on a level track and costs $80,000.

Another one of the New Mexico potash mines has ordered a number of mine cars which will have a capacity of 13 tons, or 300 cu ft, level full. One of these cars was on display at the Cleveland Coal Show. Another mine has purchased 600 tons of 75-lb rail and the necessary tools and supplies for thermit welding.

The combination of the big, high-speed, diesel-electric locomotive hauling large mine cars full of ore over heavy-duty track, appears to be the answer to many a haulage problem.

Larger amounts of underground belt conveyors are being installed to feed main line track haulage systems. One potash mine has two belts in operation while the management of another potash mine has, in 1951, approved the installation of a series of underground belt conveyors. Heavy-duty belts, 42 in. wide, will be used and one of the systems, which will ultimately be several thousand feet long, will, in conjunction with a large underground storage pocket, eliminate the third shift.

The other system will call for shuttle cars hauling the run of mine ore to a panel entry belt which will in turn discharge the broken ore into mine cars on the main line. Shuttle car hauls will be kept within 700 ft and the shuttle cars will discharge the ore, at predetermined points, onto the belt. In some cases, these panel entry belts will be 3000 ft long and cost $75 per foot installed. In this specific case, studies have shown that a savings of 10 cents per ton will be effected by installing a belt gathering system within the panel area instead of the conventional rail gathering system.

Change Mining Plan

Installation of a system such as the above often calls for a complete new layout as far as the number of entries, rooms and breakthroughs are concerned. In the above mentioned mine, it was found that a main entry system of five entries would come closer to meeting the various requirements than any other number of entries. Some of these requirements are an efficient development procedure, a satisfactory ventilation system, and a trouble-free main line.

In a like manner, it was determined that a three-entry system in the panel, driven at right angles to the main or five-entry system, was the most satisfactory. Here the belt conveyor will be in the middle entry.

Even the dimensions within the subpanel itself had to be changed in order to meet the requirements of a belt gathering system.

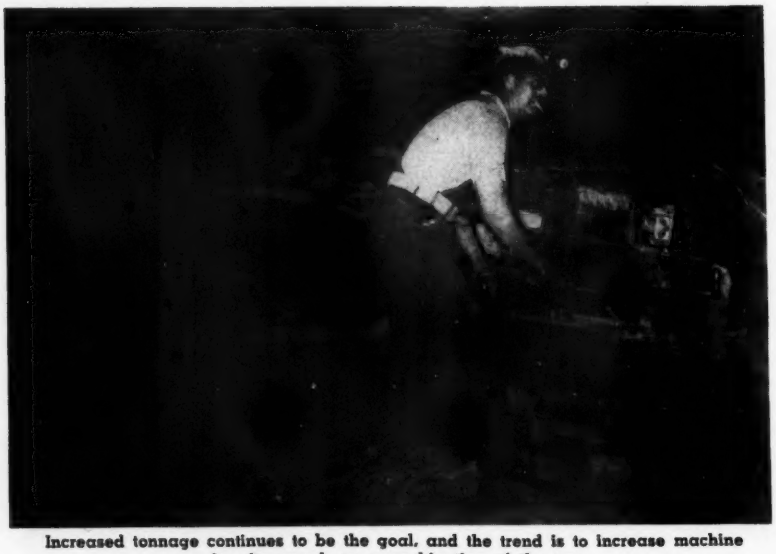
These conveyors will be called upon to take more punishment than does the average coal mine conveyor. For maximum belt life, the handling of potash ores depends upon the size of the fragmentation. This can be controlled by any one of three ways.

Control Fragmentation

One way to insure perfect fragmentation, for ease in belt handling, is to use one of the continuous mining machines on the market today. Two continuous miners are now being used in one of the Carlsbad potash mines and another such unit has been ordered, at a cost of over $65,000, by one of the other mines. Whether these machines will be used only on development work or whether they become a part of the regular production equip-

Electronic shaft signaling systems keep hoistman in constant communication with cages

Diesel-powered bulldozers are used underground to perform a variety of jobs. Here is one gobbing salt



Increased tonnage continues to be the goal, and the trend is to increase machine size, its speed, or a combination of the two

ment, is still to be determined.

Two portable crushers have been designed and while their use is not contemplated at this time, their future has possibilities. The shuttle car would, in this case, discharge the run of mine ore into the crusher which would in turn discharge the crushed ore onto the belt.

The third way to control the fragmentation to make it suitable for belt haulage, is to drill more holes and use more explosives. On first thought, this would appear to be a rather poor way to go about reducing mining costs. However, the year 1951 saw the introduction into the potash mines of a self-propelled drill carriage or "jumbo." Two auger-type electric drills are mounted on a rubber-tired carriage and the number of holes drilled per man-shift has been increased from the present 50 to 125. Here is a most striking example of how through the introduction of a new machine, two drillers are able to drill as many holes as five drillers were able to drill with the old type, post-mounted drill; and easier, too. Even though this unit does cost $22,000, it will soon pay for itself. One of the advantages of this machine over the present post-mounted drill, is that it is possible to drill a hole ten ft deep with one single drill rod. Many of the potash operators look with favor upon this method of controlling the fragmentation.

Higher Voltages Common

In the distribution of electrical power to the underground loads, we find that many of the potash mines are going to a 4160-v system. This is due to the fact that the cable cost for the 4160-v system is cheaper than for the 2400-v system. This 4160-v system is stepped down to 440 v for the various mining machines. The Bureau of Mines has requested that all face equipment be grounded, and a grounded neutral system on 440 v is safer than an ungrounded 220-v system.

At the present time many hoists are being designed to operate automatically and even the skips are being loaded automatically. Communication between the cage, the various levels, and the hoist house is now possible and the trolley phone, whereby the motorman on the main line can talk from one end of the mine to the other, is already an accomplished fact.

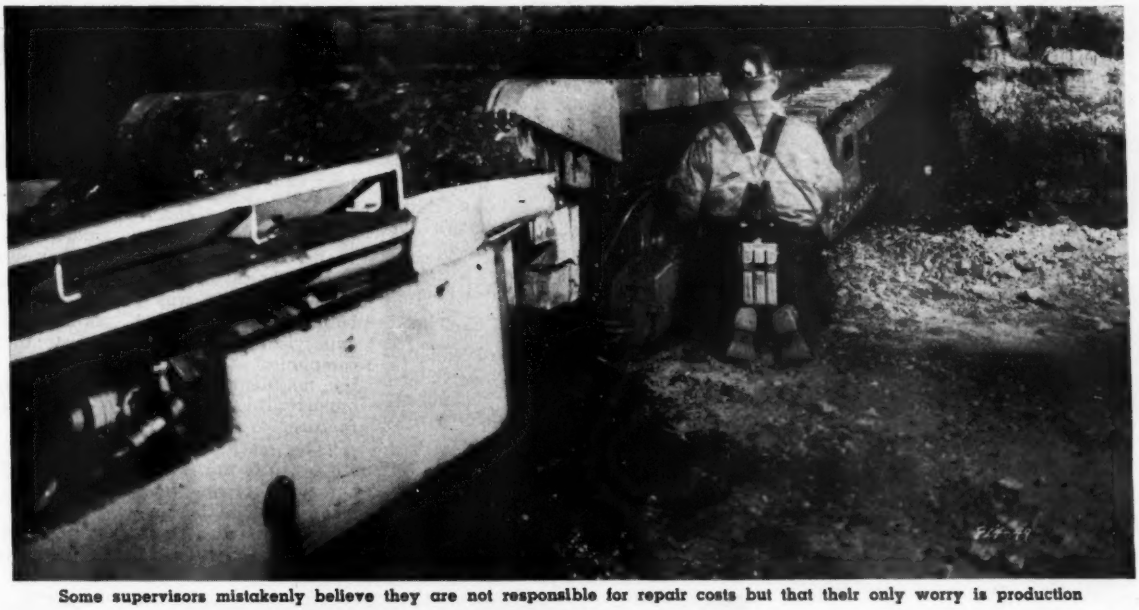
Although the above observations have been made in the potash mines of southeastern New Mexico, in general, these results have been found to be the same in other nonmetallic mines. This is particularly true of our underground salt mines where there are a large number of mining machines and vehicles. Increasing the tons per man-shift continues to be the goal and the trend is to increase either the capacity of the machine, its speed, or a combination of the two.

In the August, 1951 issue of the MINING CONGRESS JOURNAL, there appears a most informative article on "Oil-Shale Mining Developments and the Mining Industry." In this article, it is stated that it is possible to mine 148 tons of oil-shale per man-shift of underground labor and at a direct mining cost of 29 cents per ton.

More tons per man-shift must be our constant goal. Only through our mining research, in cooperation with the manufacturers will the industry be able to stay in the race with constantly rising labor costs.

Extensive surface plant of the Potash Division, International Minerals and Chemical Corp. at Carlsbad, N. M. reflects progressive policies of the company

The Foreman and The Machine



Some supervisors mistakenly believe they are not responsible for repair costs but that their only worry is production

A Report of the Mechanical Loading Committee on the Need for Trained, Conscientious Supervisors on Continuous Mining Sections; Men Who Are Aware of All the Capabilities and Limitations of Their Equipment.

By E. H. JOHNSON and R. E. CHARLIER

Subcommittee on Supervisory Training

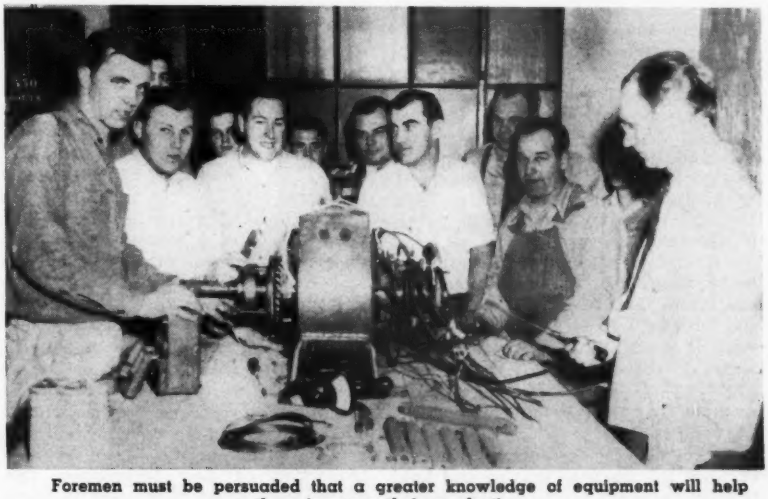
TO make continuous mining a success, one of the requirements is that the supervisor know enough about the mining machine to see that it is operated effectively and that delay time due to breakdowns is kept at a minimum.

Too often the feeling between production supervisors and those in charge of maintenance has been one of antagonism, and sometimes bitterness. In such an atmosphere it is difficult to get the production foreman even to want to know anything about the maintenance of the equipment he is using.

In mining, a foreman's reputation is built upon his production record, his safety record, his performance in labor relations and other factors. Of these the best recognized are his accomplishments in production. By interesting the foreman in increasing his unit production, breakdowns—hence maintenance costs—can be reduced. When he has been sold on the idea that the most important influence on his reputation is higher unit output, he must be shown that maintenance of the equipment in his charge is a vital factor in greater production. It is then essential to persuade each foreman that complete familiarity with his machines will help him increase production on his section.

Attitude Must Be Changed

It is of no use to approach the foreman with the argument that maintenance costs are too high or that the mechanics have more than they can do. He does not feel responsible for repair costs nor does he care how hard the mechanics must work. These are not his worries. He is interested in tons. The thinking and attitude of foremen who believe that their primary job is to get the material



Foremen must be persuaded that a greater knowledge of equipment will help them increase their production

and that it is up to the master mechanic to keep the machinery running must be changed.

First determine how much a foreman needs to know about his equipment so that he can do a real job from the standpoint of maintenance. Certainly he does not need to know as much as the master mechanic or one of his mechanics. To find this out it will be necessary first that someone with proper ability analyze breakdowns and rate them in order of their importance. Here is one approach to this problem:

(1) What is the nature of the breakdown?
(2) Can the operator fix it?
(3) Must the machine be "babied" pending an overhaul?
(4) Is it the result of mishandling by the operator?
(5) Must the operator be given further training?
(6) Was the machine forced to do work for which it was not intended?
(7) Is the trouble due to inherent weakness in the machine?
(8) Can the mechanics overcome the trouble?
(9) Must the manufacturer be called in for assistance?
(10) Can such trouble be foreseen and avoided?

Teach Foremen

Be prepared to talk to the foreman. It is necessary that he be told that it is going to be a part of his job to know enough about his equipment to see that it is operated for the greatest effectiveness. Until he realizes this he may resent the attempts of some person to indoctrinate him. The instructor should take him to the shop to see and discuss the actual machine parts; or at least photographs of such parts.

The instructor should not talk about the way the machine is built, the stresses imposed on certain parts, the working of gears or hydraulic system or other construction details. If he does the foreman will lose interest at once. What he must do is to talk about the job the machine is expected to do. Let him begin with the cycle of operation that the machine goes through to do its job. Then as he brings the various parts of the machine into operation, he will explain fully what happens. He will show the part or a picture of it to the foreman. He will tell its function, what it can stand in the way of load, speed or abuse. He will explain the *best* way to operate, keeping always in mind that the foreman is thinking of production.

By keeping the instruction in terms of what the machine will do and how it must be cared for to get the maximum production the foreman is not apt to feel that he is being forced to take a mechanic's training.

Prevent Breakdowns

An important part of this instruction must be the explanation of how breakdowns may be prevented. Often the sound of the machine or its action will indicate that something is wrong. Attention and action at this time may prevent a major breakdown, an expensive delay and loss of production. Regardless of what the foreman thinks about maintenance he must learn that production comes only when the machine is in operation. He must learn that by acquiring sufficient knowledge he can keep the machine operating a greater percentage of the available minutes in a working shift. There will be no room in any mine equipped with continuous miners for the foreman who doesn't "give a hang" about maintenance.

Build this program around the foreman's interest—production. If he has the qualities of a good foreman he will want to learn about the machine if that knowledge will help him get more coal. The problem may be simpler with the new foreman who may have been a machine operator and has been studying to improve himself. He is more likely to be willing to learn these things and apply them than the older foreman with more settled ideas and longer experience. It is worth while, however, to preserve the experience and judgment of the older men in working out the new problems arising from the introduction of new techniques. So exert every effort to present to these men the need of further training to meet these problems with enthusiasm and imagination and with due regard for safety of men and equipment. An example of the successful approach to this subject is found in the following case histories:

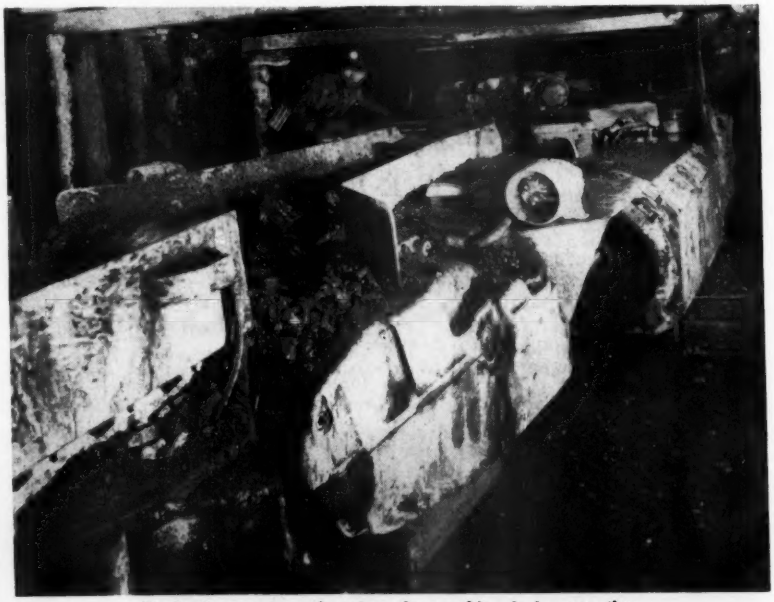
Training Supervisors for Continuous Mining

Mine No. 1—A West Virginia Operation.

"When it was decided that a continuous mining machine was to be used, company and mine management realized that certain extra steps would have to be taken to develop competent supervisors. It was decided to give both production and maintenance supervisors the benefit of several other companies' experiences and to give the maintenance foreman particular opportunities to learn from the manufacturer.

"The machine was to operate on single shift for at least one month and the Foreman was selected several months before the machine was delivered. This Foreman was given all proposed projections to study and was continually taken into discussions as to what steps, practices, etc. would be followed when the machine was put to work. It is felt that this particular Foreman was given a very good psychological build-up as to the successes expected of him and of the machine.

"The Maintenance Foreman was sent to the manufacturing concern to see the machine in various stages of assembly and to learn, from discussions with their engineers and shop men, just what the functions of



Production comes only when the machine is in operation

the various parts were and what the wear points might be. It might be noted that several of our foreman's suggestions were accepted by the manufacturer and changes made to the machine before shipment. It is believed that the Maintenance Foreman had a very thorough knowledge of what his problems were to be before the machine was shipped.

"We were quite fortunate in meeting with initial successes with the machine almost immediately and were able to develop sound operating techniques within a week. We then assigned the man who was to be the second shift foreman duties as a time study man and observer on the day shift. Through his time studies and observations he was able to get a very good grasp of the problems and when he was placed in charge of the second shift's operations, took over with good results. It is not recommended, however, to keep a prospective Section Foreman doing time study work too long. This work is tiresome and after one week or so becomes boring to a production foreman.

"The same process was carried out with respect to the third shift foreman but with only a one week observation period. All three men are doing very well and it is felt that the training program, although limited, was a success."

Mine No. 2—A Pennsylvania Operation.

"We have crews of eleven men on our panels. We take the most energetic and conservative men and put them with our officials in their sections. First, we let them obtain experience and then, we let them alternate with the others on the panels so that they get the experience of our assistant foreman, who are mechanically minded.

"We train our own men, that is, we do not bring in any trained men but use the men we have working for us.

"We take into consideration their disposition and ability to handle labor. They do not have to be hustlers just so they are steady and normal producers.

"With the help and experience we give them, they are ready when we need them. By this time, they know their duties and have a full knowledge of the machines.

"We have very low turnover."

Mine No. 3—A Pennsylvania Operation.

"We have used several methods of giving our foremen training on new type equipment. The initial installation was started on a one shift operation. A factory demonstrator was with the equipment at all times while it was operating. This demonstrator worked with the face foreman and shop foreman in teaching the operation and mechanical features of the machine. A period of approximately one month was consumed for this training program. During this period the foreman who was to take charge of the second shift spent two weeks with the machine. His time was planned and allocated so that he received instructions and through observation learned as much as possible about operation and maintenance of the equipment.

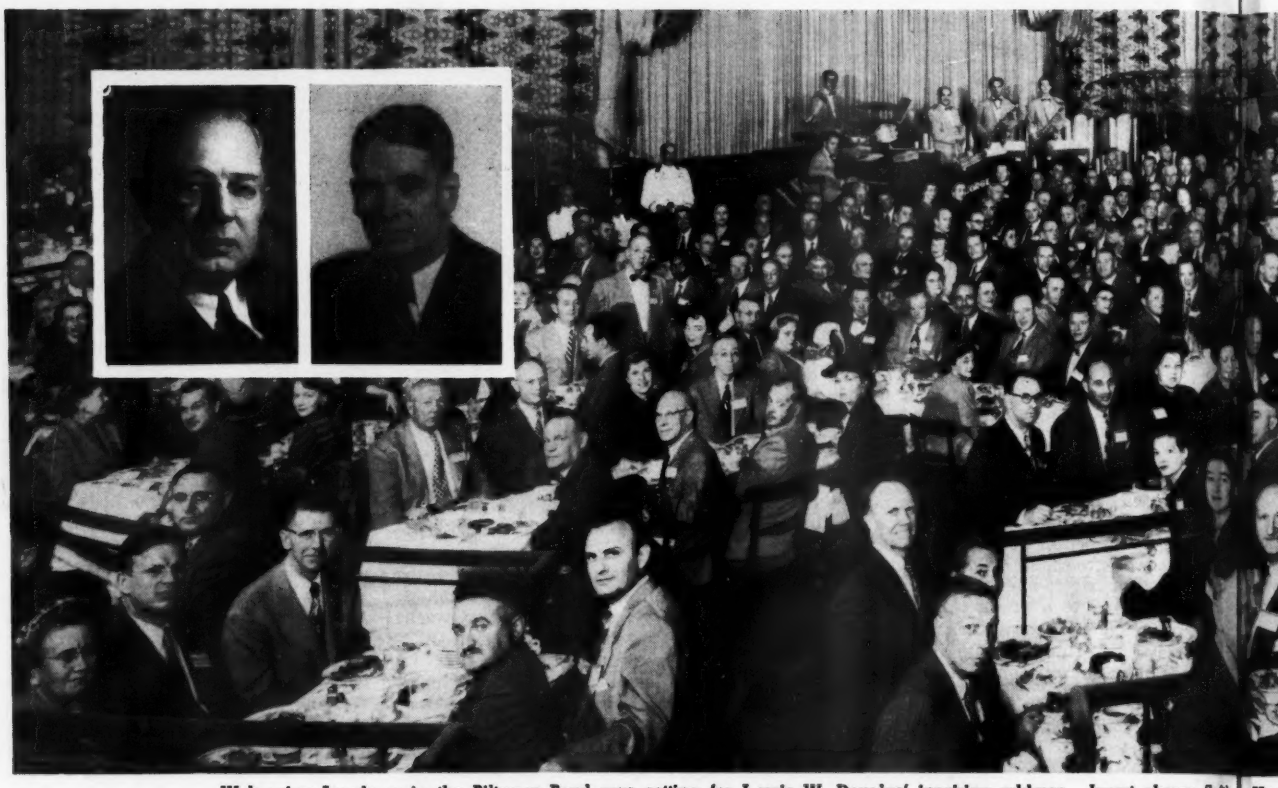
A good foreman will want to learn more if it will help him get more coal

"At the end of one month, the machine was placed on two-shift operation. For a period of two weeks another foreman was trained in the same manner as described above, at which time the machine was placed on three shifts.

"A program of having a new foreman spend one or two weeks training with a machine has been generally followed when a new continuous mining machine has been put into operation and has been found to be very beneficial to the foreman when starting a new setup.

"At several of our mines, electrical and mechanical Pennsylvania State College Extension classes have been used as a source of training both mechanics and foremen. This has been on a purely voluntary basis and has not applied solely to continuous mining, but the response to such a program has in most cases been satisfactory."

In the final analysis it is the men, rather than the machines, who are responsible for getting the coal



Welcoming Luncheon in the Biltmore Bowl was setting for Lewis W. Douglas' inspiring address. Insert shows (left) Ha

Mining and the World Situation —

Los Angeles Meeting Considers Industry's Role in National Mobilization Effort

THE 1951 Metal and Nonmetallic Mineral Mining Convention in Los Angeles, October 22-24, exceeded all expectations. More than 2000 registrants from all over North America, from as far away as Turkey, India, South Africa and New Zealand, thronged the Galeria and meeting rooms of Los Angeles' Biltmore Hotel. To make one's way through the crowds to meeting rooms, also crowded, meant seeing dozens of familiar faces and old friends last seen long ago and far away.

Such a large attendance was ample evidence of the awareness of mining men everywhere of the problems facing the mining industry, the nation nd the world in these troublous times. The National Program Committee under Ross Leisk showed excellent judgment in picking topics and speakers to discuss these problems. The program they developed comprised nine comprehensive sessions. Five of these dealt with the role of mining in the industrial mobilization program. At these the status of the Defense Minerals Program, Mining Development and Expansion, Manpower and Labor Relations, Taxation and Public Lands were thoroughly discussed by top men from government and industry.

At four sessions, the problems facing the operators of metal and nonmetallic mineral mines were covered exhaustively. Here, milling progress, rock drilling, shaft sinking and mechanical mining were considered in turn by the men most intimately concerned with latest practical developments.

Convention delegates were unanimous in their commendation of the efforts of all the local and national committees. It was their fine support and the unselfish donation of time and effort by the speakers that made this Convention the outstanding success it was. This was the fourth time in 41 years that the American Mining Congress has met in Los Angeles. Each meeting in turn has been adjudged better than the last, and all who attended this one are looking forward to the next.

Meeting Opened by Ross Leisk

Mining men had begun arriving in Los Angeles on Friday and the Convention opened Monday morning to a packed house. National Program Committee Chairman Ross D. Leisk formally called the meeting to order and after outlining the procedure to be followed, called attention to the importance of this Convention.

"The mining industry is faced with problems of more complexity this year than we have ever faced before," he said. "They are problems that are as important and vital to the welfare of the nation as they are to the welfare of the industry. No nation under the

ws (left) Harvey S. Mudd, Chairman Western Division, who presided and Ross D. Leisk, National Program Committee Chairman

conditions of modern warfare can resist aggression successfully, or can take the offensive when attacked, unless there is available a continuing and adequate supply of ferrous and nonferrous metals and minerals."

He continued by saying that some 12 or 13 years ago the mining industry was geared to a peacetime economy. Development work proceeded normally—reserves were kept up—and there were some reserve productive capacities. Then in quick succession came the invasion of Poland, the fall of France and Pearl Harbor. Ever since, mining has not been operating under a normal economy.

"We succeeded in meeting requirements for metals and minerals in World War II," he said, "but we came out of it with some pretty bad scars, and those scars were not healed when we found ourselves involved in the 'Cold War' which later blew up into a very 'Hot War' in Korea."

Leisk pointed out that our reserves, depleted during the relatively short period of World War II, cannot be replaced easily. The present situation, with no forseeable termination, will make demands upon the industry for metals and minerals that cannot be supplied from simply-developed reserves.

"For that reason," he declared, "we must face this problem squarely and realize that if we are going to continue indefinitely on the basis of a war economy, we must develop ore reserves and maintain productive capacity on a continuing basis." "Much can be done," he continued, "if we have materials and equipment with which to work. We can do even more with adequate manpower. We must, however, have conditions under which we can not only produce from our developed reserves, but also continue to make available new reserves, lest we suddenly find ourselves, at a critical time, unable to maintain the production for which we have the plant capacity."

Having thus sounded the keynote of the Convention, Mr. Leisk introduced the prominent speakers of the opening session and the Convention was under way. Abstracts of the papers and addresses given at this and succeeding sessions appear on pages 45 to 75. Many of these will be published in full in future issues of MINING CONGRESS JOURNAL.

Welcoming Luncheon

Immediately following the morning session, the Biltmore Bowl became the scene of activity on the occasion of the traditional Welcoming Luncheon. The entire crowd could not be accommodated in the Bowl, so additional loud speakers were set up in the Ballroom to permit the overflow to hear the Welcome to California tendered by Lieutenant Governor Knight, the responses by Howard Young, Ross Leisk and John Ryan, and the feature address by Lewis W. Douglas, former Ambassador to Great Britain.

In his opening remarks Harvey S. Mudd of Los Angeles, Chairman of the AMC Western Division, noted that while each of the three previous meetings in Los Angeles were held in relatively tranquil times, two great world wars were brewing. He further pointed out that the present meeting was being held in a time of crisis. "Free institutions are gravely threatened," he said, "and paradoxically in striving to defend them, we may destroy them . . . we face a formidable adversary on all counts and our opponent grows more powerful each year. To maintain our superiority we must use our resources of men and materials with greatest efficiency and skill.

"The American Mining Congress," he continued, "concerns itself with our raw materials resources and their utilization normally in peace, but now in time of prospective war, it speaks

Many delegates rose early to meet Jess Larson at breakfast

E. H. Snyder, F. E. Wormser and E. R. Lovell discuss materials supply problems with Jess Larson and Howard I. Young

for the producers of metals and minerals, including building materials and coal, in our national councils. All are essential materials for defense. The reserves of some are not unlimited in amounts. . . Southern California has great natural resources in the form of minerals, mostly nonmetallic, and is contributing its share toward the national defense."

In concluding his remarks Mr. Mudd brought out the role of the American Mining Congress in representing the legitimate interests of all miners. One of the ways in which it serves, he said, is through its conventions—this one being devoted to a discussion of the place of metals and minerals in mobilization and defense.

The Hon. Goodwin Knight, Lieutenant Governor of California, welcomed the delegates, and recalled attending the first AMC meeting held in Los Angeles in 1910, when the gavel used to call the meeting to order was made of zinc from his father's mine. He said it was a pleasure to welcome to California the representatives of an industry which produces new wealth —takes from no one but gives to all.

Howard I. Young, president of the American Mining Congress, responded to Gov. Knight's welcome, and brief remarks were made by Program Chairman Leisk and by John T. Ryan, Chairman of the Manufacturers Division of the Mining Congress.

After introducing other distinguished guests, Mr. Mudd presented Lewis W. Douglas, former Ambassadore to England, member of a famous mining family and the principal speaker at the luncheon.

In an inspiring address, which held his audience in rapt attention to the very end, Mr. Douglas spoke of the issues at stake in the present world crisis. "The overriding issue," he said, "is how freedom of the individual may be preserved." He went on to define freedom as "the right to risk one's capital, the right to work according to personal tastes and talents, the right to vote according to the dictates of one's conscience, the right to invoke judicial arbitration without apprehension or prejudice and and the right to worship the God of our own choice."

Mr. Douglas pointed out that ours, the last free society on earth, is threatened from within and without.

The Grand Ballroom was crowded as delegates heard prominent speakers from Government and Industry

"It would be one of the paradoxes of history," he said, "if in our anxiety to defend ourselves from without, we destroyed ourselves from within."

He called for an attempt to undo the mistakes made during and after World War II. He pointed out that we must rebuild our armed might; our energies must be bent toward establishing a balance of power as a basis for a practicable arrangement with countries that lie east of the Iron Curtain. It is appropriate that we do this but in doing so we must guard against too great public expenditures, which in turn would lead to the taxes and controls which could destroy us from within.

"No one can tell what tomorrow may bring," he said, "but I think a serious doubt can be cast on the hypothesis that the Soviet is prepared and anxious to plunge the world into another great convulsion." It is more likely, he thought, that they will continue their present policy for many years.

Lewis Douglas

In conclusion he stated that we must not be confused about the source of our strength. That lies in our freedom. If we would continue to play our role in international affairs we must resolve that we shall not be deluded into an action and behavior which will destroy the very thing that has made us great and powerful and the envy of the civilized world. "It is this great might of ours, derived from freedom, that the Soviets fear as much as they respect."

Conferences Attract Many

On Wednesday afternoon, following completion of the regular sessions, a number of group conferences were held which attracted a large attendance. Among these were a conference on Rock Bolting, on Roasting and Sulphur Recovery, on Uranium Mining, and one on Gold and Monetary Problems. At the latter Senator Pat McCarran of Nevada delivered a pertinent analysis of the rights of American gold miners, and Philip Cortney, President, Coty International, spoke on the effect of gold on national and international policies.

In addition to these more or less formal meetings another group met under the chairmanship of Henry B. Fernald to discuss the complicated problems of taxation. At another special gathering the strategic metals situation was thoroughly talked over, with S. H. Williston, vice-president, Cordero Mining Co., in the Chair.

Western Division Board of Governors discussed future plans

State Mining Secretaries Confer

On Thursday following the Convention, representatives of state mining associations met to discuss mutual cooperation in the resolution of the many problems which beset the mining industry. Under the joint chairmanship of Charles F. Willis, secretary, Arizona Small Mine Operators Association, and Victor J. Hayek, secretary, Mining Association of the Southwest, attention was given to pending State and Federal legislation, public land policies, incentives for the mining industry, tax matters and public relations problems.

All Enjoy Social Functions

Before the formal opening of the Convention, a gala cocktail party was held Sunday evening on the south lawn of the Ambassador Hotel. This afforded an opportunity for all who took part in the Convention to engage in eleventh hour relaxation, to meet co-workers from every part of the Union and to compare notes.

Monday evening all the miners and their ladies enjoyed a Dinner Dance in the famed Biltmore Bowl, where amid the strains of an excellent dance band after an all-round good show, they passed a delightful evening free from the cares that "infest" the day.

No regular entertainment was scheduled for Tuesday night but numerous private parties were held to meet old friends and make new ones.

High point of the week's activities, and the climax of the mining year, came on Wednesday evening, when conventioneers filled the Cocoanut Grove and Embassy Room of the Ambassador Hotel to overflowing. This was the Annual "speechless" Banquet of the American Mining Congress. Donald H. McLaughlin as toastmaster introduced the notables at the head table in his own inimitable way. Then, fortified with excellent food and convivial company, those assembled laughed heartily at the antics of Franky Fontaine and thrilled to the

The Fashion Show was enjoyed by all the ladies

beauty and singing of Lisa Kirk and the dancing of Mario and Floria.

After the entertainment had been fully enjoyed the floor was cleared and all present danced into the small hours of the morning.

Ladies' Events

While the ladies participated actively in all the activities of the Convention, they enjoyed particularly the excellent slate of special events arranged for them by Mrs. Harold J. Clark and other Los Angeleans on her Committee. A trip through Hollywood and environs Tuesday afternoon was climaxed by a reception and tea at the beautiful Beverly Hills home of Mr. and Mrs. Harvey Mudd. A Fashion Show and Luncheon Wednesday in the Beverly Hills Hotel's Crystal Room was well attended and the consensus was that it was worth every minute spent. The surroundings were as lovely as the food was good, and the furs and clothes glamorous. (N. B. May it be said here that to the masculine eye, the ladies at the Convention by day or at the evening functions could not have been outshone by Mr. Magnin's most glamorous modes.)

In addition to these planned events, the "loot" which the ladies carried away from the shops of Los Angeles bespoke the excellent job the Los Angeles hostesses did in guiding visiting ladies to points of interest.

Trips Top Off Program

The excellent plans prepared by the Trips Committee permitted those who could stay over on Thursday to see some of the Southern California's most efficient mining operations, on a bus trip to the Crestmore Mine of the Riverside Cement Co., the Irwindale mine and mill of Consolidated Rock Products Co., and the impressive steel plant of the Kaiser Steel Co. at Fontana. This group also enjoyed a visit to the famous Mission Inn, a veritable storehouse of wonderful curios from all over the globe.

A trip by air and bus to Inyokern Naval Base and the American Potash and Chemical Corp.'s Searls Lake plant, on Friday, was voted an experience not to be missed.

Board of Governors Meet

At noon on Wednesday, the Board of Governors of the Western Division, AMC, convened at a luncheon meeting. Here Merrill Shoup, president of the Golden Cycle Corp., of Colorado, was unanimously elected chairman of the Western Division for 1952. He will play a leading role in developing plans for the 1952 Convention and Exposition to be held in Denver. Also duly elected were the candidates for the Board of Governors nominated by the various state associations.

Plans for the Denver meeting, to be held in the City Auditorium September 22-25, were discussed and approved. This meeting will be on fully as grand a scale as was the Salt Lake City meeting in 1950, and indications are that it may be even larger.

Telegrams from the Mayor of Seattle and from the president of the Seattle Chamber of Commerce, inviting the Western Division to hold its 1953 meeting in that city, were read by R. M. Hardy. An invitation from Phoenix was presented by Charles Willis. These invitations were warmly received with the understanding that a decision would be made at an early date.

One of the high points of the Board of Governors meeting was a talk by Howard Young. In this he recapitulated the information brought out during the Convention regarding the position of the mining industry, and stressed the point that he and other DMPA officials are in Washington to "help the defense program and mining and not to tell the industry how to do its job." He promised to do the best job possible and ended with a plea for increased production.

Resolutions Approved

At appropriate points during the Convention, the resolutions which are incorporated into the Declaration of Policy, reproduced on pages 41 to 44, were presented and unanimously approved by the delegates. This declaration sets forth clearly the views of the mining industry on national policies affecting the production of metals and minerals.

The Resolutions Committee, under the inspiring chairmanship of Donald A. Callahan of Wallace, Idaho, vice-president of the American Mining Congress, had met on the two days preceding the Convention, to consider suggestions sent in by mining men from every part of the United States. Out of these deliberations, and couched in language that reflected the high ideals and forceful eloquence of the Chairman, came the principles which will guide the industry in its earnest efforts to perform the Herculean tasks set for it.

This is the last Declaration of Policy that will have the benign guidance in its preparation of Donald Callahan's vast wisdom and vigorous expression. Long a leader in the industry's councils, he was stricken at the conclusion of the Committee's work, and died a few days later. He leaves the industry richer for the ideals and principles for which he fought and they will continue to serve as the beacon toward which mining will chart its course.

"Speechless" Banquet in the Cocoanut Grove climaxed the mining year

A Declaration of Policy

WESTERN DIVISION, AMERICAN MINING CONGRESS

Adopted at Los Angeles, Calif., October 22-24, 1951

THE MINING INDUSTRY, engaged in a vast program of increased mineral production, once again pledges itself to the defense of our liberties and the maintenance of our way of life.

The steady production of minerals is essential in insuring our national safety and well being. New mineral resources must be opened up and to this end public land policy, foreign economic policy, tax policy, regulation of the sale of mining securities and other Government policies must be so framed and administered as to encourage exploration for and development of our latent mineral resources.

Investment of venture capital, intelligent working together of labor and management and an enlightened policy of government toward this essential industry will form a chain reaching from the untapped sources of mineral wealth to the products which furnish security and happiness for our people. Loss of time, wasted effort and inefficiency must be eliminated in these times of danger.

We urge that the Government direct its efforts toward increased production of metals and minerals rather than toward curtailment and elimination of their uses. To bring this about there must be a streamlining and simplification of Government agencies and the elimination of a multiplicity of bureaus dealing with mining activities.

We of the mining industry reiterate our unyielding opposition to Communism and call for the elimination of all subversive activities. We ask for a return to that original concept of democracy believed in and practiced by the founders of this republic and their descendants who have preserved it, made it great, and given us an enviable position in the world of free men.

MANPOWER

In order to maintain maximum productivity, it is essential that the mining industry be protected from the loss of skilled and experienced manpower, which assumed disastrous proportions in World War II.

We commend the policy of the Armed Services in deferring the drafting or calling to military duty of men skilled and experienced in the activities of this industry which are so essential and critical to the supply of materiel.

The Wage Stabilization Board and other governmental agencies should prevent the setting of rates in new or expanding industries and military installations which will result in the pirating of manpower from the mining industry. These mushrooming industries and installations should be required to train and utilize personnel to as full an extent as practiced in the mining industry.

If necessary to achieve these purposes and in order to keep the national working force in gear with the increasing volume of tasks to be performed, Congress should exercise its prerogative of lengthening the standard workweek.

LABOR-MANAGEMENT RELATIONS

A. Communism in Labor Unions

There is immediate need for adequate laws to prevent communistic control of labor unions. We reiterate our previous recommendations to achieve this end and additionally recommend that Congress should:

1. Direct the Department of Justice to publish a list of all labor organizations found to be communist-dominated or controlled.
2. Provide that the National Labor Relations Board shall deny to such labor organizations any status whatsoever and to their members any rights or protection under the Labor-Management Relations Act.
3. Prohibit any employer from affording such labor organization the privilege of dues check-off.
4. Direct the Department of Justice to proceed forthwith with prosecutions for perjury against union officials who have sworn falsely in signing the anti-communist affidavit.

The utmost cooperation and support should be given the announced Congressional intent to expose and eliminate such communistic control of labor unions.

B. Monopolistic Labor Practices

Monopolistic labor practices continue to increase. Monopoly or restraint of trade by labor unions is contrary to the public interest. The provisions of the present law authorizing the union shop, which accelerate the trend toward monopoly, should be repealed, and any legislation tending to facilitate compulsory unionism should be vigorously opposed. Labor unions, when fortified by compulsory unionism and multi-unit bargaining, concentrate such vast power into so few hands that the menace must be eliminated by dissolving these monopolies and by making it unlawful to compel any person to join a union in order to earn a living.* For the same reasons we oppose any collusion of management and labor that operates to the detriment of the public.

C. National Emergency Strike Prevention

The Taft-Hartley Act procedure for preventing national emergency strikes was effective to end the 1951 strike which almost completely paralyzed the nonferrous metals industry. The unnecessary occurrence of that strike demonstrated, however, that unjustified delay in invoking the procedure to forestall a threatened industry-wide strike can nullify its effectiveness to prevent loss of production. Such dilatory tactics obviously defeat the purpose of the law.

D. Unfinished Labor Law Program

Our previously expressed views on the strengthening of the laws governing the employer-em-

* We urge the reading of the excellent article "Free Men vs. the Union Closed Shop" by Donald R. Richberg, published in the July 16, 1951 issue of "The Freeman", copies of which may be obtained from the American Mining Congress.

ployee relationship, with respect to: sabotage; the respective rights of management and employees; the use of terrorism and other unfair labor practices; improved National Labor Relations Board procedure; the substitution of a Department of Employer-Employee Relations for the Department of Labor, and amendments to the Labor-Management Relations Act, are reaffirmed.

UNEMPLOYMENT INSURANCE

We deplore the widespread abuses in administration of unemployment compensation laws, which, under the guise of Federal protection of the employee's earning power, undermine his self-respect, personal ambition and work incentives, and destroy his dependence on himself for economic support. Such abuses endanger our free economy and our system of free enterprise. They contribute substantially to inflation, impairing not only the value of legitimate unemployment payments, but also the purchasing power of all wages.

We condemn the recurring proposals of the Social Security Administrator to include mine "leasers" within the definition of "employees" and we urge the rejection of this provision as proposed in pending legislation.

We likewise oppose any effort to Federalize the unemployment compensation system.

GOVERNMENT EXPENDITURES

The costs of the emergency and of essential functions of government should be met adequately and efficiently, honestly and fairly, without waste and extravagance. Activities and projects, even if justifiable in normal times or as normal functions, should be curtailed, deferred or eliminated, unless absolutely essential in the emergency. Political favoritism, and local or group pressures, should find no place in determining defense needs or costs. It is the duty of citizens and organizations, the Administration and the Congress, not to ask or permit any violation of this basic principle. We have not the resources, neither the materials nor the personnel, to waste or misuse. Legislative and administrative authorities should insist on applying these principles to budgets, appropriations and expenditures.

Appropriations of ninety billions a year will approach $2,000 per average family. No American citizen should be forced, either directly or indirectly, to bear the burden of waste, extravagance and inefficiency.

TAXATION

In the last year three new taxing acts have been passed, imposing $16 billion in additional taxes. This, added to the taxes of prior laws, is above the maximum we should raise by taxation if we are to maintain the system of private enterprise we are striving to preserve. Our fiscal policies should be reviewed and revised to remove their inflationary effects; our spending policies should be brought under control; and our revenue policies should be designed to last for the period of the emergency.

With the need for unprecedented revenues, taxes must be imposed and administered fairly, equitably and honestly. Tax authorities should strive to administer the law as Congress intended. They should cease endeavors to find some narrow, hidden sense to justify regulations, rulings, definitions, and decisions designed to defeat the Congressional intent. Our system of income taxation cannot be satisfactorily maintained unless the tax enforcement agencies retain the confidence of the public in their integrity and impartiality and in strict adherence to the law.

In recent revenue legislation, the Congress has made a sincere effort not to penalize resourcefulness, efficiency and economy in achieving maximum production at minimum cost. In spite of that endeavor, our tax laws, particularly the Excess Profits Tax, have failed to achieve such standards. Amendments should be made to that end, and the Excess Profits Tax should be repealed.

Congress, conscious of our mineral deficiencies, has recognized the need for removal of tax obstructions to discovery and development of new mineral resources and increased production from existing mines. This action has gone a long way to improve the situation, but other measures still are needed further to remove the road-blocks to adequate productivity. These include the following:

Full allowance should be made for losses of loss years without denial of percentage depletion for the year to which the loss is carried over.

Depletion should be allowed the stockholder as well as the corporation.

Tax exemption should be granted a new mine for three years after beginning of profitable operations.

Depreciation should be more fairly allowed, with full application of the tax-benefit rule.

In taxing the stockholder on dividends received, allowance should be made for the tax paid by the corporation on the earnings which are distributed.

The tax rates in the upper income brackets should be reduced. In no case—even in the emergency—should the overall tax on the individual exceed 50% of his income. This would leave greater incentive to the creation of income and would yield greater revenues to the Government.

GOVERNMENT MINERALS PROGRAMS

Pursuant to the Defense Production Act, the Government has assumed authority to regulate the mining industry during the emergency by means of allocations, price controls, wage and salary stabilization, taxes and similar devices. In exercising that authority the Government through its administrative agencies has assumed certain responsibility to the industry.

We urge these agencies to cooperate with the mining industry and establish a realistic minerals program with emphasis on production and the development of adequate ore reserves. To this end we recommend prompt action that will:

1. Provide a supply of metals and minerals sufficient for National defense and essential civilian use by removing deterrents to production and providing appropriate incentives, the most powerful incentive being a realistic uniform price structure. Present ceiling prices in some instances prevent the maintenance and expansion of domestic production.

2. Assure stable metal prices for a sufficient time to stimulate mine development and permit additional production.

3. Maintain and extend the ore reserves needed for national security by constructive administration of the tax law recently approved by Congress and thereby further the development of our mineral wealth and make venture capital available for the speculative endeavor of developing new mines.

4. Afford to domestic mines at least the same price and other considerations and advantages given foreign properties.

STOCKPILING

National security requires a healthy domestic mining industry with ample productive capacity and experienced working forces. We approve and have urged consistently the stockpiling of metals and minerals essential for defense and emergency needs. But we believe the most efficient and economical procedure is to stockpile when output exceeds demand and that it is in the national interest to adjust or suspend stockpiling purchases during a period when critical shortage of metals causes dislocation of production in defense and essential industries.

Our greatest protection is industrial strength. We recommend maintaining adequate capacity for the production of strategic and critical metals and minerals within the United States.

TARIFFS

Our people should not be left dependent on foreign ore reserves as a source of supply in an emergency, however important it may be to import some metals and minerals to supplement domestic production and fill our stockpiles with materials in which we are deficient. World political conditions as well as the hazards of possible air and submarine warfare support this conclusion.

We recommend, therefore, that Congress exercise its authority over tariffs to be administered for the welfare of the American people and provide reasonable protection when needed against competition from low foreign wages and depreciated currencies.

We oppose inter-governmental commodity agreements that call for state control over industry, or involve international regulation of production and prices in conflict with our traditional principles.

FINANCING OF PRIMARY MINES

We urge that the Securities and Exchange Commission proceed promptly to make needed modifications in its regulations in order to facilitate public financing of primary mining ventures.

PUBLIC LAND POLICY

Our mining laws were designed to encourage and have encouraged the discovery and development of the mineral resources of the country by private citizens with private capital. Under them, the United States has become the world's greatest producer of metals and minerals. On two occasions within the last thirty-five years, availability of these resources made it possible for us to produce the sinews of war necessary to protect our national existence.

We oppose any change in those laws. We adhere to previously expressed views that further moratoria in assessment work requirements should not be granted.

There is great need for a more cooperative attitude on the part of the Bureau of Land Management toward the mining industry in the administration of these laws. This administration should be free of the concept that public lands should be socialized; that multiple uses of the surface contemporaneously by miners, timbermen, stock grazers, and resort owners, or any combination of one or more of these, under the supposedly benevolent guidance of an army of land administrators, is a practicable or a desirable objective to attain; that there is anything inherently wrong in the free use of the surface of this land by a bona-fide mine locator or a mineral patentee.

Fraud in mineral location has always been and still is a ground for legal action by the Government as holder of the paramount title. The courts are always open to both criminal prosecution of and injunctive relief against a fraudulent locator. But this does not mean, as has been suggested in the Pacific Northwest, that the mine locator is to be deprived of his property and his day in court upon bare accusations of a local administrator which may or may not be supported by competent evidence.

What is needed is a more vigorous utilization of existing legal procedures to correct such abuses as may exist. Previous administrations have corrected such abuses through court procedure, as in the Grand Canyon cases. No valid reason exists why the present administration cannot do likewise. We condemn and deplore the misrepresentation of these procedures in the Pacific Northwest by the Bureau of Land Management and their deliberate attempt to incite public hostility to present mining laws.

Transfer to the United States Geological Survey of the functions of mineral land examiners, and a provision that the Survey's findings as to sufficiency of mineral discovery should be binding on both mineral claimants and the Government, would facilitate proper procedures, particularly in the National Forests.

Further cooperation from the Bureau in promoting mineral development is needed. This cooperation by the Government could be most effectively achieved:

1. By accelerating the issuance of mineral patents, thus making the financing of new mine ventures much easier.
2. By administrative regulations under the Grazing Homestead Act which will protect the right of the bona fide mineral locator to adequate surface, water and access easements for development of the minerals which he has located.

We emphatically oppose the proposed transfer of the administration of the public land laws from the Department of Interior to the Department of Agriculture.

GOLD AND MONETARY POLICY

With the complete lack of any effort on the part of our Government to restore the gold standard, the paper dollar continues to depreciate as expenditures by the Administration mount to fantastic levels.

Restoration of the gold standard with free convertibility of the dollar and gold is an essential step if financial integrity on the part of governments is to be regained.

Without the monetary stability provided by the gold standard, other efforts to check inflation are certain to be ineffective. Efficiency and economy can be enforced only when the discipline of the gold standard can be used by the people themselves to require governments to conform to sound and honest financial practices. A currency not backed by gold and silver invites unrestrained deficit financing, waste, and careless acceptance of commitments impossible for future generations to meet without ruinous inflation. Such procedures

play into the hands of our enemies no less disastrously than blunders on the diplomatic front.

Now that the International Monetary Fund no longer bars member nations from taking independent action with regard to sales of gold on the free market, the prohibition by the United States Treasury on ownership of gold by American citizens and on the sale of gold by American producers becomes a particularly unfair restriction which should be removed.

We therefore urge:

(1) That the restrictions on ownership of gold by American citizens be removed.

(2) That the producer be allowed to sell his gold domestically or abroad in order to determine at the earliest possible date a price at which gold and the dollar can again be made freely interchangeable with the most beneficial and economic effects.

(3) That the gold standard then be reestablished with the dollar defined in terms of gold at the indicated and intelligently determined price.

SILVER POLICY

We endorse the existing Federal policy with regard to the acquisition of silver for its beneficial influence upon the base-metal mining industry, as well as for its traditional service in providing a base for a portion of the nation's currency.

GOVERNMENT REORGANIZATION

We deplore the failure of the Congress to enact into law at a faster rate those recommendations of the Hoover Commission having to do with reorganization of the executive agencies of the Federal Government.

Three years have elapsed since the Commission's report was submitted to the Congress. Many of its most important proposals have had no consideration and others have been misapplied. New agencies have been created and old organizations extended, adding thousands of new employees and resulting in waste and inefficiency.

More than ever, there is need for application of the principles of the Hoover Commission reports in order to control and direct this appalling growth of the Federal bureaucracy, and to bring about sound management with economy and efficiency in each agency, civilian and military.

In the field of public land management, there was a narrowly divided opinion in the Hoover Commission as to the allocation of natural resource agencies to the Federal Departments. The majority favored transfer of the Bureau of Land Management from the Interior Department to the Department of Agriculture. This we oppose as contrary to the best interests of the mineral industry and of the country. We favor the minority report, which supports the general principle that all natural resource agencies should be administered in the same Department.

BUREAU OF MINES—GEOLOGICAL SURVEY

The Geological Survey and the Bureau of Mines are the two long-established agencies of the Federal Government concerned with the mineral resources of the United States and their development by private enterprise.

We again express our confidence in the able personnel of these agencies and the fine professional services rendered to the industry and to the Nation. They can function effectively only if completely free from all political influence.

We commend the excellent administration of the retiring director of the Bureau of Mines, Dr. James Boyd, and urge the appointment of a successor who has a similar high sense of public responsibility and technical qualifications for this important office.

NATIONAL MINERALS ADVISORY COUNCIL

In 1947, the Secretary of the Interior established the National Minerals Advisory Council, composed of executives of enterprises engaged in the extraction of metals and minerals and in their fabrication, or as consumers of the products of these industries. The Council is representative of and enjoys the confidence of the mining industry. It is potentially an effective instrument of non-political aid to Government in this critical period of mobilization for defense.

We urge that the advice and assistance of this Council be fully utilized by those agencies concerned with mineral production.

LAND USE

We view with disapproval any legislation to compel restoration of the surface of lands mined by stripping or dredging which would hamper orderly extraction of metals or mineral products and place unwarranted economic burdens upon the mine operator.

MINE EQUIPMENT

An adequate supply of machinery and equipment, together with materials for maintenance, repairs and operation of the mines and processing plants, is necessary to maintain and increase our mineral production.

To meet this need, adequate quantities of steel, copper, aluminum and other scarce materials must be made available to the mines and to the manufacturers of mining machinery and supplies.

FREE ENTERPRISE

Free, private, competitive enterprise is the rock upon which our mining industry is founded. Upon this solid foundation the prospector with his faith, courage and industry, the engineer and geologist with his genius, the metallurgist with his research and the business executive with his infinite capacity for taking pains, have built that mighty structure of mineral production which supports our national economy and protects our security as a free nation. We call upon the statesmen and rulers of the world to bring about that peaceful climate in which this great enterprise can add to the happiness and well being of all earth's people. We ask that the vast mineral treasures of a bountiful Creator shall cease to be fashioned into weapons of destruction.

Abstracts of Convention Papers

Brief digests of talks delivered at the Convention are presented here. A number of the papers have already been published and future issues of Mining Congress Journal will feature the full texts of many of these informative addresses.

The Defense Program —Its Dependence on Raw Materials

By HON. KARL R. BENDETSEN
Asst. Secretary of the Army

A ONE-SENTENCE summary of our national mineral situation today is this: For the next four years, and probably for the next five years, the full production of all operating mines in the United States will be required to meet the needs of the military production program and essential civilian requirements, with as much as possible of certain critical materials reserved for the national stockpile. We will not have any lasting surpluses of any strategic or critical material in the foreseeable future.

We are today short of most vital materials needed for war. We are paying inflated prices for those materials. We are taking elaborate—even extravagant—measures to eke out our dwindling reserves. We are almost right back where we were in 1943.

What shall we do to correct this grave deficiency of minerals? First, deal with the present shortage, and second, improve our long-range policy and program for the future. Now that we have a critical shortage upon us, emergency measures are called for.

In the military departments there is an increasing awareness of the need to make substitutions wherever possible. We have many well-conceived programs to reclaim materials from waste and worn-out equipment. We are down-grading the alloys for military equipment wherever this is safe.

Industrial concerns should similarly make all raw materials go as far as possible and cut down waste. The Department of the Interior and Defense Materials Procurement Agency are steadily encouraging more intensified production and development of our minerals supply. Foreign procurement is likewise on the increase. Cooperative efforts are being made by our Government, and the governments of other friendly nations, to encourage international exchange of information on ways to save and extend our strategic materials.

For the longer-range future, the painful shortages we are now experiencing may prove a valuable lesson. Let us surely learn it this time!

There must be more systematic, more imaginative planning by all responsible persons to insure the future availability of the materials so essential to both peacetime and wartime strength. There must be more aggressive scientific research in substitute materials, into ways to extract magnesium, aluminum and titanium and the other useful metals more efficiently. The mining industry's problems must be carefully studied, to encourage maximum preparedness for capacity production. Any State or Federal regulation tending to restrict output ought to be given careful scrutiny.

There should be an intensification of our research into the utilization of low grade reserves and the extraction of by product minerals. There should be more research and development in the use of industrial wastes. Half the national requirement of manganese can be recovered from steel mill slags. This can be done and it deserves our support now.

Above all, our long-range future program should encompass an adequate stockpile for all essential military and civilian needs. I do not consider that the military and industrial security of our nation adequately provided for unless we have physically on hand—an ample stockpile of every strategic and critical material that good judgment tells us we will need for war.

Our minerals program is not the only one susceptible to improvement. National security depends on immediate steps to improve our posture on all fronts. Now is the time to attack our national security problems on the political front with aggressive energy, and to follow through in the economi-psychological and military fields with decision.

I have endeavored to point up some of the major prob-

lems which face us with respect to raw materials in national security; to indicate to what extent our national security program depends on raw materials supply. Import taxation, depletion allowances, manpower and all of the other complex issues which must go into the solution of our national raw materials policy are matters which will require the best brains and combined efforts of the entire industry and government agencies working night and day. It would be difficult indeed to over-emphasize the importance of an adequate and carefully developed program for raw materials to our national security and the preservation of the American way of life.

What's Wrong With Our Raw Materials Supply?

By HON. THOMAS E. MARTIN

Member of Congress from Iowa

MINING and agriculture are the great sources of raw materials. Prior to World War I the essentiality of the domestic mining industry and metal supplies to our national defense was not realized and the total number of mines producing nonferrous metals in ten western mining states was allowed to fall from 11,033 mines in 1935 to 2308 mines in 1949.

For more than 150 years Russia and America have been recognized as the two great "have" nations of this earth. But American leaders have been tardy in recognition of the need for stockpiles of the most strategic and critical minerals and metals to offset rapid depletion of the reserves which placed us in the "have" position.

Prior to 1939 recognition of the need for a stockpile was negligible. Public Law 117 of the 76th Congress authorized a meager $100 million for stockpiling to be distributed over a period of years. A variety of reasons made it impossible after our entry into World War II to build our stockpiles. Failure of national leaders to realize that mine production cannot be turned on and off as a water spigot seriously handicapped the mining industry in its effort to meet war needs, but it responded magnificently.

Public Law 520 in 1946 revealed a better concept of the essentiality of the mining industry and an adequate stockpile program, but because of lack of executive understanding and because of some congressional failures we are today trying to determine what is wrong with our raw materials supply.

America plunged into the Korean War without our Federal Government having done much toward the vigorous domestic mining industry envisioned when Public Law 520 was enacted. Since June, 1950, many agencies have been created to deal with the metal shortage. There has been a resulting confusion and overlapping of jurisdiction. O.P.S. contributed to the metal shortage by fixing domestic prices at levels considerably lower than the world price and made complete allocation of scarce metals a necessary step. Identical conditions in copper, lead, zinc and most of the minor metals have cost consumers many times more than the savings instituted by the establishment of ceiling prices.

Estimated requirements for civilian and military needs have not been improved over World War II and estimates are apparently produced out of thin air with little regard to history, present trends, or true facts.

Many of our strategic and critical metals and minerals are imported almost 100 percent but even under present conditions, with world sea lanes open to us, we are unable to obtain from abroad all we need. A broad, intelligent program must be adopted for the development of new exploration on the North American continent or there will be continued shortages and curtailment of civilian and military activity. Our present stockpiles are badly depleted. At the time Public Law 520 was under consideration the estimates of total needs were based on the following yardstick: "That amount of all strategic and critical materials needed for a five year world war at the highest annual rate of consumption of that material for any year of Warld War II, plus the quantity of that material that should be produced in the Western Hemisphere under war conditions over the period of any new world war."

The full program of acquisition was not followed, and at the outbreak of the Korean War after four years of the acquisition period had passed by, the total value of the stockpile on hand on July 1, 1950 was only 38.4 percent of the total stockpile objective. Even with the tremendous stepping up of stockpile acquisition during the first year of the Korean War our stockpile acquisition stood at only 36.1 percent of the increased objective. If our yardstick had been adequate in 1946 and we had maintained the five-year schedule as planned we would have had 82 percent instead of 19 percent of the present stockpile objective on June 30, 1950. That difference would have given us much greater security at the start of the Korean War; enabled us to avoid the world competition for strategic and critical materials, and would also have helped develop and maintain a healthier and more stable mining industry in the United States.

Spurious arguments have been advanced regarding conservation of our mine resources through not expanding and developing our own mining industry. Free trade in metals and minerals is a constant threat and the "Buy American" policy has been sharply condemned by our Chief Executive. It is time for the leaders of the mining industry to work everlastingly and unitedly to bring about better and more widespread comprehension of the basic essentiality of the stockpile and a vigorous mining industry in the defense of our Nation. The salt mines of Russia are not a fit place for Americans to meditate in defeat. Wake up, America! It is later than you think!

National Mineral Policies

By JAMES BOYD

Retiring Director

U. S. Bureau of Mines

TEN YEARS opportunity to observe and participate in the formulation of national programs to cope with problems involved in maintaining the nation's mineral supply have taught that due to the inadequacy of government organization in the mineral field the expert recommendations of the Bureau of Mines and Geological Survey are often lost in the maze of administrative confusion.

Mineral policies cannot embrace only conservation and development of domestic resources. They must also encompass the problem of foreign supply. Our copper, lead and zinc resources no longer permit the full self-sufficiency enjoyed in these metals for so many decades. Mineral policies must, therefore, involve foreign as well as domestic

affairs. The nation's foreign policy should be a means of attaining our mineral aims rather than minerals being a minor and neglected element in the accomplishment of our global objectives.

In recent years there have been many reductions in the protective tariffs in certain key industries which have in the past provided the nation with self-sufficiency in major strategic minerals. If and when world conditions return to normal, some of these domestic industries will be unable to survive competition from foreign sources. It is evident that the freedom not only of our own citizens but of the entire world, depends upon the wisdom with which our leadership is exercised.

Producers and consumers of minerals have a common interest in the formulation of sound, national mineral policies but they alone cannot obtain the objectives sought. It is, encumbent upon the mineral industry, to educate the public to the urgent need for the establishment of sound mineral policies and an effective Federal organization to carry them out.

My experience in Washington has convinced me of the urgent need for creating a centralized agency with the status of cabinet rank to coordinate the efforts of the large number of bureaus, agencies, administrations, departments and corporations of the Government concerned with minerals. The head of the agency should be in a position to present recommendations for mineral policies to the Congress with authority to implement such policies and see that they are carried out. Years of experience in the mineral industry would be the prime qualification for the top administrator of such a department. Without such experience we cannot hope to achieve the positive action that will be required to maintain the flow of minerals necessary for our security and the national welfare.

DEFENSE MINERALS PROGRAM

Session Chairman

HOWARD L. YOUNG

President

American Zinc, Lead & Smelting Co.

STATUS OF THE DEFENSE MINERALS PROGRAM

Report from Government, With Industry Discussion and Questions: Representing Government—Jess Larson, Tom Lyon, C. O. Mittendorf, Dr. Wm. E. Wrather, and Harold A. Montag. Representing Industry—Roy A. Hardy, E. H. Snyder, P. R. Bradley, Jr., Frank A. Ayer, H. S. Taylor, Robert G. Page, Jos. H. Taylor, J. B. Haffner, and Fay I. Bristol.

* * *

JESS LARSON
Administrator
Defense Materials Procurement Agency

THE Defense Materials Procurement Agency was created because of the necessity of having a world wide approach to the materials shortage problem, and also to tie procurement contracting and expansion together. A great deal of very fine and constructive work has been done. Dr. Boyd and his colleagues accomplished a great deal and the foundations he laid will continue to guide us.

DMPA has three primary responsibilities. First, to procure from the spot markets of the world the materials necessary to carry out our defense requirements. Second, the maintenance of a strong domestic economy. Third, fulfillment of our stockpile objectives. The Defense Materials Procurement Agency is an emergency agency. It is unfortunate that we must solve our problems under emergency conditions. It emphasizes the long period during which this country should have recognized the necessity for a strong national raw materials policy and the building of a strong domestic mining industry.

One thing has been accomplished toward an atmosphere within which mining can grow strong. The provision for the write-off of exploration investment and increase in depletion allowances in the recent tax bill will strengthen our entire domestic economy and the mining industry in particular.

One of your current problems is the very serious problem that confronts industry on the labor front. But if we in Government, and labor in its wisdom will see the value of a policy that enhances the production of minerals and metals, I think the situation will be met.

The President has called to Washington some of the top people in industry to study the whole materials problem. A report by this committee is now being edited and will shortly be published. It is my responsibility to procure materials at the lowest cost to the American taxpayer, but I fear that prices will be higher than ever for many essential things when this report is made public. The shortage of materials goes further than DMPA, it goes further than DMA. It goes to the very foundation of the American system. It goes to our foreign policy because the American system is based upon ever-increasing production and the application of American know-how to achieve it at an ever competitive rate. We can only achieve and maintain our economy by a dependable and accessible flow of raw materials, including metals and minerals.

Deficiencies in essential raw materials can only be met by ingenuity. We must engineer around some of these requirements by increasing the efficiency of our metals. We must strive to shorten the time for exploration and development of reserves. Under the direction of Mr. Charles Wilson and the Office of Defense Mobilization, it is the responsibility of DMPA to develop a program indicating the amount of money necessary and tax amortization necessary to expand production to meet such deficiencies.

In order to carry out such responsibility Congress has made available the Defense Production Act of 1950, which has as its underlying philosophy, expansion of our productive capacity through the use of private capital and through the ingenuity of private enterprise. Government can enter into purchase contracts which will put a floor under the selling price of the product from any particular mine or mill. This approach not only assists in the battle against inflation, but strengthens the system of free enterprise. Congress has provided also in that Act that we may

extend the facilities of the Government, including funds, to encourage exploration and development in the mining of critical and strategic materials. But, we in DMPA are not going to indulge in any program that is throwing the American taxpayer's money down the well.

We can assist in the expansion of private industry by guaranteeing loans made through private financing channels, a provision which has not been resorted to very much heretofore. It is hoped that in the future we can encourage greater use of that. We can make direct loans, but these are obviously more inflationary than if capital is drawn from private investors. We also have authority under the Act to install additional equipment and facilities in Government-owned or in privately-owned plants, factories and other facilities to expand production. This power would be resorted to only in dire circumstances. These are the devices that are available to us and which Congress has made available as the bulwark of our program.

We cannot perform miracles. We hope we have impressed you with our appreciation of the seriousness of the problems that exist and of our honesty in endeavoring to solve those problems.

TOM LYON

Defense Materials Procurement Agency

THE mining industry has embarked on a tremendous expansion program, as a result of the Government preparedness program which has created a need for basic minerals and metals far beyond normal peacetime needs. Government has been forced into this expansion because, only it is in a position to estimate the expansion required. It has confined itself, however, to indirect participation and the mining industry is following the same channels that have proved effective in the past. Government's indirect participation has taken the form of accelerated tax amortization, guaranteed floor price or guaranteed market contracts and direct or guaranteed loans. Other forms of assistance are more in the nature of special purpose devices. Through the use of all these devices the mining industry will have expanded its annual capacity greatly by 1955.

It is not hoped to obtain enough of some metals to satisfy both civilian and military demands, but the present situation will be relieved and if a full scale mobilization is necessary, there will be enough metals to satisfy all of military demands, except in one or two instances.

Participation of the Government in this expansion via the accelerated tax amortization route can be estimated at 10-20 percent of the total amount. By the guaranteed floor price contracts and by loans which DMA has recommended $16,104,000 has been granted. These are production loans and are exclusive of loans for exploration. It can be conservatively estimated that the total planned expansion program will amount to well over two billion dollars.

C. O. MITTENDORF

Acting Administrator

Defense Minerals Administration

THE exploration program now in progress is an outstanding example of the desire of Government to assist private enterprise in the development of its mineral resources. Public Law 774 specifically recognizes that exploration and development of new mineral sources within the United States must be stimulated, and that the work should be done by private enterprise.

In early January many discussions were under way within DMA and other defense agencies with industry representatives concerning ways of carrying out the express wishes of Congress. The plan now in effect is substantially in accord with the principles suggested by the National Minerals Advisory Committee on January 29 of this year. After due consideration of ways and means of implementing this program, we were able on April 11 to announce to the mining industry that we were prepared to do business.

Under the regulation, Government will participate in the total cost of an approved project by furnishing from 50 to 90 percent of the money. The extent of Government participation is dependent on the mineral being sought and the exact percentages for each commodity are fixed by regulation.

Within six months after completion of an approved exploration project the Government must examine the work and declare whether or not a significant discovery has been made. If the project was a failure, the indebtedness is cancelled. If it was a success, the Government requires return of the funds loaned on a sliding royalty basis ranging from 1½ to 5 percent of the net smelter returns. After ten years, the obligation to repay the Government expires and the property thereafter is free of all liens, regardless of whether the entire loan has been repaid or not.

On October 15 the agency had approved a total of 180 contracts toward which the Government contributed 59.9 percent. Forty-eight additional cases were in final stages of contract preparation.

Out of the first 180 projects, 113 went to new operators, not listed as active during 1950. This represents 63 percent of the contracts signed and 36 percent of the total funds approved. These data indicate considerable new interest in exploration and the fact that small, medium and large concerns are quite evenly represented. All of the conventional methods of exploration typical of the mining industry can be found in the list of projects under way.

The program has great possibilities and although it has been in effect only a few months, some significant discoveries have already been indicated. We are fully aware of the many problems which will arise during the course of an exploration project. In order to avoid loss of time, authority for the on the spot amendment of contracts has been delegated to the nine regional field teams.

No claim to perfection is made but so long as we are performing our part of the work in Washington and keep abreast of the problems, there is every reason to hope that the program will succeed. Suggestions for improvements so that the exploration program can be conducted in the manner in which both Government and industry may take mutual pride will be welcomed in Washington or at any DMA regional offices.

DR. WM. E. WRATHER

Director

Geological Survey

IT IS traditionally the function of the Survey to work in the fields of long range geological research and investigation in the science of ore deposition, on the development of geological theories and techniques that can be adopted and used by the mining industry. Its viewpoints must be nationwide in scope and its objective is to be of the greatest possible public service in its field. These are the guiding

principles of the Geological Survey. In recent years we have striven to build up a competent geologic organization dedicated to these principles.

By July 1950 we had succeeded in closing out the type of program instituted in World War II and had launched a minerals program concerned almost exclusively with the type of project we felt was in line with these principles. By and large, these are activities that can be expected to pay off only through long-continued effort. Most regional studies require five to six years of field investigation.

With the Korean War came new responsibilities. The creation of the defense agencies in 1950 and the decision to use the staffs of old-line agencies to service the new ones meant that during the last year a goodly portion of the time of our more experienced geologists has been expended in the discharge of duties required by the Defense Production Act.

The Defense Production program is an emergency program oriented rightfully toward relatively short range projects. It is a quite different type of activity from that to which we were carefully gearing ourselves and conditioning our staffs to perform. In concert with the engineers of the Bureau of Mines, we have assumed, at the behest of DMA, the job of reviewing each application for Government loan, procurement contract, etc., that has come to the Defense Minerals Administration. We are charged with advising as to the merits of each from the standpoint of reserves, actual or potential. There is no question in our minds as to the importance and critical nature of the production expansion program. We propose to carry our full share of the job that falls within our sphere of competence. We are concerned, however, in maintaining a proper balance between the emergency program and our "regular program." The shift of experienced men to emergency work has already set back our production schedules. Several important projects have had to be laid aside. Others have been slowed down or changed in emphasis because of the transfer of key personnel to other tasks. This disruption of the regular survey program interrupts the main flow of data needed to give guidance to our part in the Defense Program. Our regular program provides the only continuing source of data on geology and related minerals problems available to the Government. The field examinations conducted for DMA would be well-nigh meaningless were it not for the wealth of background data that our staff has accumulated over the years. To seriously cut back our regular field program to devote our energies to spot examinations and property appraisals dries up the main sources of information available to the administrators of the emergency program, and deprives industry of a service which, in the face of what may be a long drawn out emergency, seems more essential now than ever, as a basic element in the emergency. We should and must accomplish this program.

HAROLD A. MONTAG
Director, Mining Machinery Division
National Production Authority

OUR country is in danger, and our primary goal is to prevent another world cataclysm. The best way to do this is to get as strong as we can, as fast as we can. The real difference between World War II and now is that we are not actually engaged in war activities of global proportions. The country in 1950 was operating its industrial plants at record-high levels and now a vast military program must be met, in addition to keeping the civilian economy healthy. It was felt from the start that if the military objective was to be accomplished and at the same time high levels of civilian production maintained, controls would eventually be necessary.

Basis for all efforts in this direction would be to overcome the shortages of scarce and strategic basic raw materials. The Requirements Committee must try to meet all segments of the military program with as little serious dislocation to the economy of the country as possible while ensuring essential civilian production. The job is as complicated as it was in World War II and poses a great many new problems. The program determinations for the first quarter of 1952 are the most adequate that have yet been handed down. It is quite obvious that mining operations and mining machinery production must be perfectly attuned to expanding aluminum and steel production while every safeguard must be used to overcome the losses of copper and to prevent any further losses. Ninety percent of requirements are reasonably assured and an over-all adjustment of ten percent should not be too difficult to accomplish. Experience has shown that adjustments of this size can be accomplished between segments of the industry. If this fails NPA has always come to the rescue in the past.

The first quarter of 1952 is the one in which the military bite is really going to be felt, and as regards controlled materials, it is going to be the tightest squeak. The second quarter may be almost as bad, but barring a major war the program should start to click in the first six months of 1952 and shortages should begin to disappear gradually.

ROY A. HARDY
Cons. Engr. in Charge
Getchell Mine, Inc.

THE U. S. Bureau of Mines has estimated the domestic production of tungsten at little more than one-third of domestic civilian requirements. This leaves no domestic production for military purposes.

A seven-point program which would accelerate production of tungsten concentrates is given herewith:

1. Lower grade tungsten ores must be mined and milled.
2. Buying stations should be established in tungsten producing areas empowered to purchase tungsten ores and mill products not up to specification; and to enter into contracts with small owners which would yield them a fair profit for ore delivered at the buying station. They should also contract for low grade ores from large mines to eliminate present waste.
3. Concentrating plants, wholly or partially financed by the Government, should be established in strategic tungsten areas.
4. A more realistic price per unit of tungsten should be considered immediately. (Foreign price is now over $70 per unit.)
5. Allowance should be made for transportation to authorized receiving plants for ores and low grade concentrates.
6. In addition to molybdenum-free tungsten stockpiles, stockpiles of tungsten concentrates having molybde-

num content of that used in alloy steel should be established.

7. There should be no prohibitions by the Wage Stabilization Board to prevent the small miner or workman from contracting his services to advantage, where this will increase production.

What has been said with reference to tungsten, in general applies to uranium.

Production could be greatly increased if one Government stockpile accepted lower grade ore. Large plants with improved metallurgy and milling equipment should be working on known large low grade deposits in the United States that may average only .05 percent U_3O_8.

Plants should be erected at mines where large low grade tonnages exist for cheaper operation.

The small miner is really important and should get more of the dollar paid for uranium and tungsten. He should also be given more help, such as assaying samples and making advances on shipments, quicker purchase settlements and the acceptance of lower grade ores at receiving plants.

E. H. SNYDER
President
Combined Metals Reduction Co.

THE exploration program explained by Mr. Mittendorf was in S. 2105. This was defeated by industry, not by Government. The pattern there is being followed very closely now, but it would have been considerably better if it had been adhered to starting four years ago.

In the past year DMA has made wonderful progress. The conscientious hard work of people like those on the platform here have established a sound base, and the industry is fortunate in having the best administrator in Washington and the man at the top of our industry running mining affairs from here on out.

Between controls on one side and labor on the other, these men have a tremendous handicap. Already the two-cent increase in the selling price of lead and zinc, which they obtained for us, has been eaten up by wage and freight rate increases. There is little these men can do about such handicaps, but they are mentioned here for passing along to responsible agencies in Washington.

P. R. BRADLEY, JR.
President
Pacific Mining Co.

SINCE it is impossible to cover the entire subject of Federal aid to mines in five minutes, I will go on to another subject, that of administration. There were some things in Mr. Larson's talk which should encourage the mining industry, and there were others in which there is an element of discord. Particularly, it was disheartening to hear that there is some difficulty about obtaining money. Does this mean that even though purchase contracts can be made with more facility than before, are the funds for such contracts available?

(To this question Mr. Larson answered "yes.")

This moves over into the encouragement category then. It was encouraging also to hear Mr. Larson's personal philosophy in respect to taxes. He can't be accused of subscribing to the "spigot" idea of metal production. It is good to know that he is one lawyer who has sense enough to know when he doesn't know about mining.

It would seem from his discussion of the subject of Section 302, loans against contracts for purchasing or for services, that there seems to be an opening for mill owners to get money from private sources. This is particularly encouraging if the Government in buying the ore and dealing with the mill owner, will specify over a period of years how much ore he will be given to mill, and guaranteeing to relieve him of risk in case ore is not forthcoming. Jim Boyd should be given recognition for his fine work with DMA, especially in getting authority which was not there originally. Jess Larson should be commended for so quickly acceding to the suggestions and advice of Boyd.

Other questions which were raised during Mr. Mittendorf's talk were as follows: How much money is available for exploration, how much is expected in the course of the next few months, how is the money coming in, and how long can we expect this program to continue?

Have any projects that were initiated in June or July been finished and certified either as failures or successes?

* * *

Mr. Mittendorf: Before the Appropriations Committee we asked for $40 million for fiscal 1952; with the exploration we have approved and projects now in the shop, $20 million will be spent. All of the $10 million actually on hand will be spent within the next three weeks.

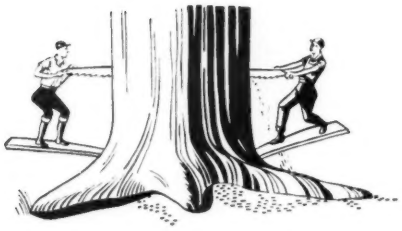
Due to the confusion resulting from the change in administration, there is doubt as to the location of the exploration program and it has become necessary to prepare a new letter asking for money based on the average cost of the average project approved so far. This is about $38,000. Using that average against what is in process, $19 million additional Government funds will be requested, and there is every reason to believe it will be granted.

In regard to certification of projects, there have been two or three on which field teams have written in suggesting that they be terminated.

FRANK A. AYER
Vice-President
Copper Range Co.

IN October 1950 Copper Range Co. received from DMA an urgent request to present at earliest possible date all pertinent data on the White Pine Mine with a view to bringing it into production. These data, based on milling 10,500 tons of ore per day and producing 75 million lb of copper per year, were rushed to Washington as a result of extremely great efforts on the part of this company and its consultants. DMA officials were so impressed with the potentials of this mine that they requested the whole project be recalculated on the basis of 21,000 tons per day.

Since then a whole year has elapsed and no final agree-



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..."it takes a TOUGH Conveyor Belt to haul a tough load!!!"

Mounting labor costs and shortages of local workers caused a large Southern Lumber Company to install conveyor belts for unloading lumber.

The idea worked fine. Several carloads could be unloaded simultaneously on the belts with minimum effort, handling costs were reduced and a confused traffic situation was eased.

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A local Republic Distributor, called in for advice, quickly solved the problem by recommending use of Republic Record Maker—a conveyor belt with tough rubber exterior and a rugged, mildew-resistant carcass . . . a belt widely used in coal and metal mining.

Today, 4 years later, the job's still going smoothly! Raw lumber rolls steadily into the mill on Record Maker Belting. There have been no work stoppages due to belt failures, and company officials claim the operation is now 4 times more efficient than it was when ordinary belts were used.

You'll achieve similar success with Industrial Rubber Products only if the products are properly applied to the job. Take advantage of Republic Rubber's free service offering to have a complete analysis made of your requirements. Write us today. Whether it's Conveyor Belting, Transmission Belting, Hose or Packing—there's no substitute for the best!

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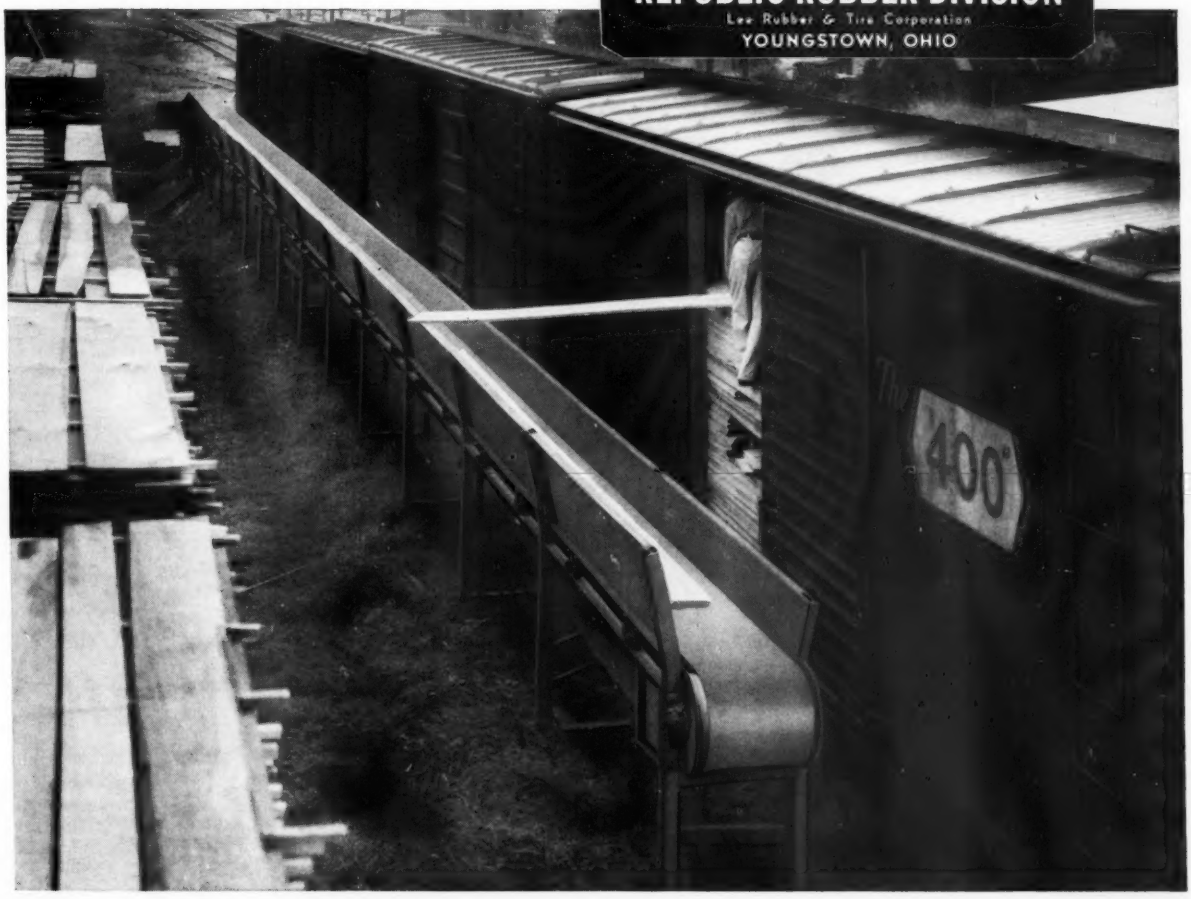
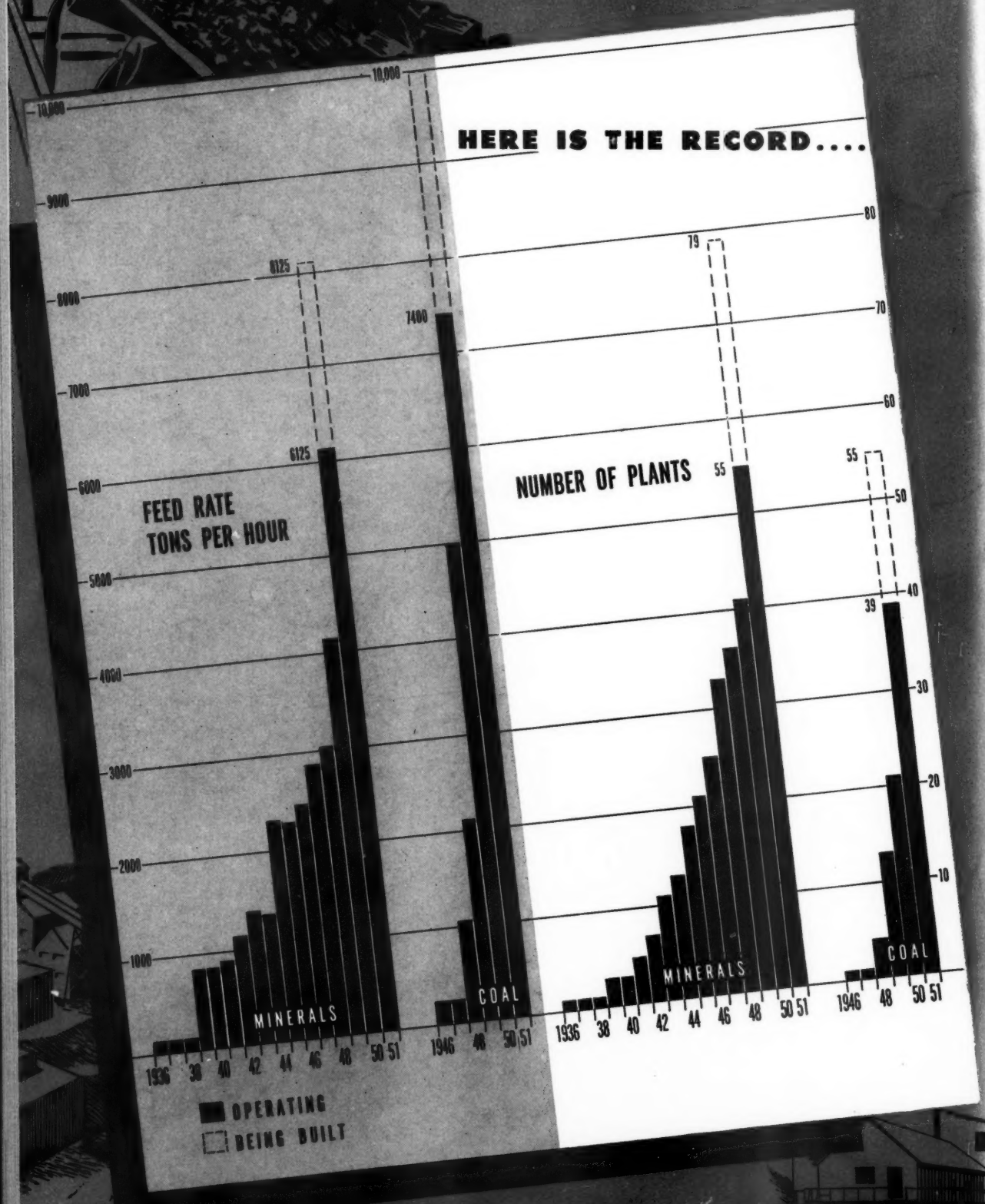


YEAR-END PROGRESS REPORT



ON HEAVY-MEDIA SEPARATION

....HERE ARE THE REASONS

A year ago, 62 Heavy-Media Separation plants with a combined capacity of 9300 tons per hour had been built.

Today, 134 Heavy-Media Separation plants built and building have a combined capacity of 18,125 tons per hour . . . a 96% overall gain in one short year and a 100% gain in coal cleaning capacity . . . the greatest year's gain in the phenomenal acceptance of Heavy-Media Separation by coal producers.

No other cleaning process ever achieved such rapid acceptance by so many leading operators on so much tonnage from so many seams under such diverse operating conditions. That record is solidly based on these good reasons:

Heavy-Media Separation is the only coal cleaning process that closely duplicates on a commercial scale over a wide size and gravity range, the perfect gravity separations obtained in heavy-liquid tests.

Heavy-Media Separation alone provides unique and exclusive applications of magnetomotive force to provide constant control, conditioning and recovery of the medium. Any process which does not provide this exclusive 4-stage medium control cannot duplicate Heavy-Media Separation results in both grade and recovery of coal and recovery of medium.

Heavy-Media Separation maintains the desired separating gravity within ± 0.01 at any gravity from 1.25 to 2.50 . . . can cope efficiently with intermittent feed or sudden increase in the refuse content of the raw coal.

Heavy-Media Separation provides automatic, continuous and complete removal of large and variable amounts of refuse without volumetric limitation.

Heavy-Media Separation recovers more near-gravity coal than any other method, as demonstrated by the profitable installation of Heavy-Media Separation units to recover salable coal from the refuse and middlings of older cleaning processes.

Heavy-Media Separation is no longer new or experimental. Before you decide on any separation method for a new cleaning plant or to supplement your present facilities, it will pay you to inspect an operating Heavy-Media Separation plant . . . to make a comparative study of its better over-all grade and recovery.

As Technical and Sales Representative for Heavy-Media Separation Processes, we can run carload tests on your coal in the Heavy-Media Semi-Commercial Plant at Stamford, Conn. Although we do not design or build plants, we can put you in touch with experienced engineering-construction firms who do, including builders of prefabricated plants with capacities up to 400 tons per hour. We will work closely with your staff or engineers of your choice in the design and initial operation of your Heavy-Media Separation Unit.

AMERICAN Cyanamid COMPANY

MINERAL DRESSING DIVISION

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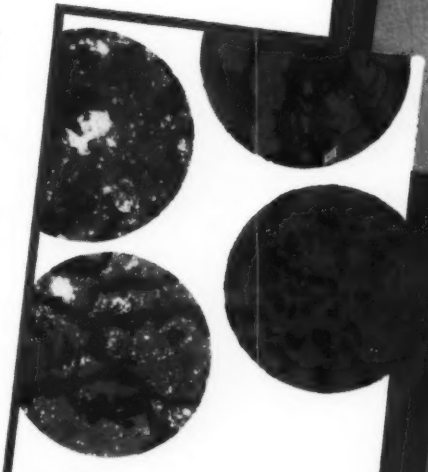

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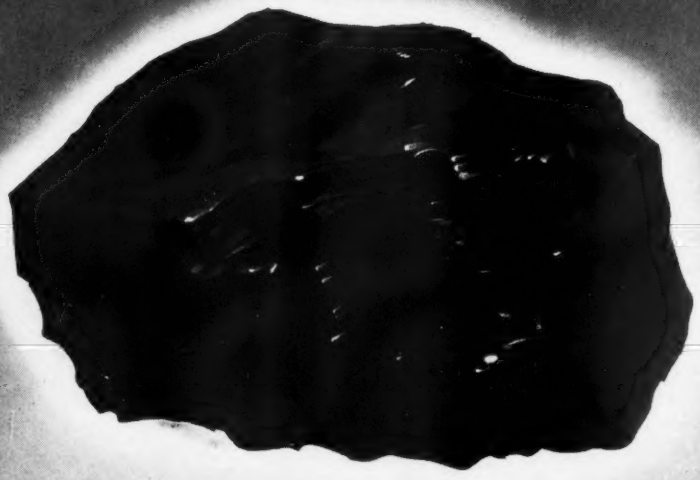
This informative 36-page book, clearly and concisely explains the fundamental principles of the Heavy-Media Separation method. With photomicrographs of medium samples from an operating plant, it shows how Heavy-Media Separation employs unique and exclusive applications of magnetomotive force to provide constant control, conditioning and recovery of the medium. It describes typical operating plants, contains test results, flow schemes and other new useful data.

You're Looking at the Promise of an even Better Life!



A lump of coal? . . . Yes, a lump of coal!

For no one can foretell the great things still to come from this basic and abundant resource.

Already, almost 70% of all the fuels used by America's electric utilities is coal—and each ton of steel needs a ton of coal in its making. Coal supplies 45% of the heat for our homes, factories and public buildings. And coal is the "miracle" ingredient in thousands of useful new products—perfume and plastics, synthetic rubber and sulfa drugs.

Coal is fertilizer for our farms, cement for our buildings. Coal provides steam and electric energy which spin the machines in our factories.

Today coal supplies power to make the good things that make up our good life. In the future, coal will make more products available to more people at the lowest possible prices.

How fortunate there's coal enough to power America's progress for hundreds of years! For coal accounts for 92% of America's entire fuel reserves.

How fortunate that America's privately-managed coal mines are the world's most efficient! Equipped with the latest modern machinery, the American miner's output is 4 to 24 times that of any miner in Europe or Asia.

If you are responsible for choosing a fuel—to power a factory—to heat your home or other building . . . *consider these important advantages of bituminous coal.*

DOWN-TO-EARTH FACTS ABOUT COAL!

- **Lowest-priced fuel almost everywhere!**
- **Modern automatic equipment cuts labor costs.**
- **Easiest and safest to store *of all fuels!***
- **America's vast reserves make coal's supply always dependable!**
- **Dependable supply assures price stability!**
- **A progressive industry strives constantly to deliver an ever better product at the lowest possible price!**

BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

FOR ECONOMY AND DEPENDABILITY

YOU CAN COUNT ON COAL!

ment has been made to grant the help so necessary for a small mining company to bring into production a mine which can produce over 180 million lb of copper per year. The reason for this apparently lies in the number of separate authorities and agencies whose approval was required in transactions of this kind. The individual effort of the officials of each of the agencies is deeply appreciated, but the many obstructions and changes in authorities and regulations which were beyond their control defeated the project.

Recent important strides in centralization of authority to purchase minerals, make contracts and grant necessary aid to potential producers lead the industry to look forward with confidence to a new era of action and results in expanded domestic mineral production. We wish Jess Larson and Howard Young every success in overcoming the obstacles which will confront them, and we know they will receive the whole-hearted cooperation from the mining industry.

During the past year of waiting substantial sums were spent for finding and developing other new ore reserves, but it seems inconsistent to finance the finding and development of new mines and at the same time to take no action to bring into production very large mines already found and developed. During the same period the Government has financed, on a grand scale, prospecting in foreign countries. Overseas copper producers have also received a premium of three cents per pound over what has been paid to domestic producers. It should be borne in mind that much of the money sent by the United States to foreign countries under FEA will never be repaid. On the other hand, domestic companies which need only a loan and contract to bring great mines into production, will pay back every penny advanced to them. No more time should be lost in getting such mines into production in our own country, where they are safe and will be immediately available in times of national emergency, as well as peace.

HARRIE S. TAYLOR

President

Oglebay Norton & Co.

THESE remarks will be directed toward certificates of necessity for iron ore which have bogged down in Washington. There is no question but what the great expansion of this country and its ability to fight two global wars stems from the fact that it had the great Lake Superior Iron Ore District to supply the ore necessary. In 1939, 45 million tons of ore were shipped from the Lake Superior District. In 1942, 93,500,000 tons were shipped, and in 1951 about 90 million tons will be shipped from the Lake Superior District. This increment came primarily from the open pits and latest figures showed that in 1950 there were 650 million tons of open pit ores remaining. It will not be long before this tonnage is completely depleted. This would be a very discouraging picture except for the low grade taconite in the Lake Superior District. To develop an open pit iron ore body costs about $3 to $5 per annual ton of output, whereas to develop the taconite will cost $30 to $40 per annual ton of output. Every aid and assistance should be given those who venture to make such tremendous investments for expansion.

Reference may be made to the large ore bodies being discovered in foreign countries, but we must be strong within our own borders, have our own ore supplies here. The experience of World War II with Chilean iron ores taught us that. Taconite plants are absolutely urgent defense measures.

The steel industry has been asked to expand its facilities to manufacture 12 million tons more of steel in 1953. This will require 78,300,000 tons of pig iron and it takes approximately two tons of ore per one ton of pig iron. In spite of the recognition of the necessity for these new developments, policy with respect to application for certificates of necessity has changed from week to week. The iron industry would appreciate the granting of these certificates. Mr. Young has tried hard but he cannot do it alone. It is hoped that those who now oppose the granting of the certificates will change position, so this country under a program of defense will not find itself defenseless.

ROBERT G. PAGE

President

Phelps Dodge Corp.

WHEN the Defense Production Act of 1950 was passed the functions of stimulating new mine production were divided between many different Government agencies. It was not surprising that with such division of authority the mineral program did not work very well. It seems therefore that setting up DMPA under the Office of Defense Mobilization was a very wise move.

It was also wise to set this up as an emergency agency, without the policies, procedures and habits of thought of the old line agencies, which are not well adapted to carrying out emergency functions. DMPA is a very new organization. Its concept is good and it seems to be on the right track. We wish it well.

JOS. H. TAYLOR

Vice-President

Peru Mining Co.

MR. LARSON and Howard Young have done a great service to the country in raising the price of zinc and lead two cents. We have rolling mills that use zinc, and they have been able to get a little more zinc now, but they can't sell it because if they roll it they have to sell it below the market. That I hope will be taken care of soon.

New Mexico is the fourth or fifth state in the Union in zinc production. It is the third in production of copper. There is a strike, going on in our area for a whole year, that has cut production and should be settled. If it were settled zinc production for New Mexico would be increased 20 percent immediately. Aside from this, unless added mills are built, no increased production of zinc can be expected from New Mexico. There should be a stable price as well as a higher price for zinc. The recent two cent price raise was immediately turned over to labor as a part of a twenty-plus cents an hour increase in wages. If this wage increase had not been given, the zinc industry, as well as the copper industry, would have been shut down.

J. B. HAFFNER
General Manager
Bunker Hill & Sullivan Mining & Concentrating Co.

IN listening to the remarks made here, no serious complaints have been heard, so it can be concluded that all of the men here from Washington are doing a fine job for the mining industry. Their work in presenting testimony to the Senate Finance Committee for fair and proper treatment of expenses for development and exploration, as well as for continued fair treatment for depletion, is deeply appreciated. These provisions will certainly provide incentive for the finding of new mines and additional ore bodies in old mines.

Raising the ceiling price of lead and zinc was a step in the right direction and it is realized that the recommendation for this action came from Mr. Larson's office. From Mr. Montag's office, as well as from the Geological Survey, we have gotten the ultimate in cooperation.

The northwest may again be faced with an electric power shortage. It is significant to note that the only areas in the United States subject to power shortages are those in which the Federal Government has assumed the job of planning and providing power generation facilities. When the Defense Power Electric Administration issued its first curtailment order it was indicated that zinc would be considered the critical metal and no emphasis would be placed on lead production. In the mines of the Coeur d'Alene District to curtail power at any level, whether it be for mining, milling, smelting or refining, will reduce the production of all metals.

At Bunker Hill there is a lead smelter and a zinc plant which treat ores and concentrates from all over the Coeur d'Alene and adjacent districts. The perennial threat of power shortage necessitated acceptance of some of the power for these plants on an interruptable basis. When the October 1 order came around cutting out the interruptible power, it meant that some 1200 or 1300 tons of super high grade zinc would be lost to the economy each month. Rain intervened and the power was not cut off as threatened, but the threat still remains.

With all the money spent on Government dams and power plants at Bonneville, Grand Coulee and other places, why should there be a power shortage? The aluminum industry is in the northwest for only one reason—power. Only about 30 percent, or less, of aluminum production goes into actual defense production. The aluminum industry, however, takes 58 percent of the power in the northwest power pool and only provides two percent of the employment. When an old established mining district has to play "second fiddle" to a new industry such as aluminum there is something wrong. Mr. Larson and Howard Young are urged to do their best toward the proper distribution of available power in the northwest with due consideration to old established industry and naturally also to the material necessary for the defense program, rather than material for pots and pans.

FAY I. BRISTOL
President
Bristol Silica Co.

SINCE the establishment of a 4500-ton chrome program in June, approximately 1900 tons have been mined and are in the stockpile. Approximately 25,000 tons have been developed since the program was announced in June. As a result, it became necessary to call a meeting of the chrome miners and inform them that the program carried a limit of 2000 tons of ore per mine, a top limit of 200,000 tons. One operator has developed 8000 or 9000 tons which is in excess of what he can sell. He has asked whether he could go ahead and diamond drill, whether he should mine the chrome and develop other mines. We are at the point of exceeding the program as announced and would like to know what to do. Must each mine produce no more than 2000 tons per year, and can more than 200,000 tons of chromium be produced through the Grants Pass stockpile? There are 47 active properties at the present and some 150 are contemplated.

A power cut at Bunker Hill would mean loss of 1200 tons of zinc per month to the nation

MILLING PROGRESS

Session Chairman

E. H. ROSE

Research Engineer

Tennessee Coal, Iron & R.R. Co.

Innovations in Processing Tungsten Ores

By CHAS. H. SEGERSTROM, JR.

President

Nevada-Massachusetts Co.

MORE than 30 years experience in treating domestic scheelite ores at a plant in Tungsten, Nev., have culminated in the recent development of milling methods which may be the "ultimate as far as present-day technique goes."

In tracing the history of the plant from its erection in 1917 to the present time, the many complex problems faced over the years and how they were solved, were recounted. Latest plant developments and present methods, it was predicted, will give a better recovery, reduce flotation expenses, and raise the plant capacity substantially.

The original milling plant at Tungsten was placed in operation in 1918 and was used until November, 1943, when it was destroyed by fire. A new plant was built and many improvements incorporated. Problems in the milling of domestic scheelite revolve around the tendency of the mineral to slime when ground, and the practice of screening to remove undersize material as soon as liberation is effected is a logical and unique step. Its flexibility no doubt will result in even better milling practice in time.

In the face of lower grade ores, with consequent higher percentages of impurities, only the new milling methods described have kept this company in operation for a long period of time. However, each tungsten deposit must be considered separately, as grade, grain size, and grain distribution vary with each deposit, and all have an effect on ultimate recovery.

Heavy Media Separation of Northern Alabama Iron Ores

By J. B. BAKER

Manager

Schroeder Co.

THIS paper was published in full in the November, 1951 issue of MINING CONGRESS JOURNAL.

The Centriclone Classifier

By KELLOGG KREBS

Metallurgical Consultant

San Francisco, Calif.

THE Centriclone employs the forces of the centrifuge with control of force and time of action combined with the shearing force of the cyclone. Some 30 installations of Centriclones have been made in the past year. Some of its applications are in the preparation of mine fill from tailings, desliming and thickening of flotation feed, elimination of colloids ahead of filters, production of high slip clays, sizing of cement plant raw materials, manufacture of milks of lime and magnesia, and other industrial applications.

The machine's scope of usefulness is to classify very thick pulps where overflows of high density with 65- to 200-mesh grinds are desired. The Centriclone also makes sharp cuts in the micron range. With complete control of both the force and the time for the required sorting action, this new tool offers a specialized but expanding field of application to the mineral industry.

MINING DEVELOPMENT AND EXPANSION

Session Chairman

EVAN JUST

Editor

Engineering & Mining Journal

What the Future Holds for Metals and Minerals

By DR. JOSEPH ZIMMERMAN

Editor-in-Chief

Daily Metal Reporter

THE domestic metal industry is being kept in a price strait-jacket by the Office of Price Stabilization while foreign producers and consumers are enjoying freedom of action. With the domestic prices of copper, lead and zinc below world price levels, the United States is no longer getting as much of these metals from abroad as it did previously. Foreign consumers are competing for marginal supplies of metals which they need for their own increased consumption, for their war effort and also for the stockpiles which they are building up. United States net imports of copper thus far this year are approximately 40 percent lower than they were in 1950

and the net imports of lead are down approximately 52 percent. This slump in imports coupled with the loss in production in the United States as a result of the recent strikes in the mining industry, have accentuated the serious metal shortage in this country at a time when the United States has embarked on an extensive armament program.

The domestic metal industry is being greatly handicapped by the confusion in Washington. It would take all the wisdom of a Solomon for the Government agencies to control a complex economy such as ours, and unfortunately many of the Washington agencies are long on controls and short on wisdom. The result has been confusion upon confusion resulting at times in a Tower of Babel, where one Government agency does not understand or want to understand what another agency is saying or doing, and this lack of understanding frequently prevails among the officials in the same agency.

There are instances of NPA officials suggesting price changes for certain metals which the OPS has failed to heed.

The Office of Price Stabilization should remove the blinders it has been wearing and take a more realistic view of the world market conditions. If the Government persists in keeping domestic prices below world levels, then the United States should enter the world markets, buy the metals that are needed, resell them to domestic consumers at OPS price ceilings, and pocket the loss. That, of course, would constitute a subsidy to foreign producers which certainly would not sit well with the domestic mining industry.

Government should draw on its metal stockpile to a greater extent than it has in order to alleviate the metal shortage.

The peak demand for metals will be felt during the first half of 1952. Supply and demand will come into closer balance after the bureaucrats in Washington relinquish their controls.

Defense Trends

By BRIG. GEN. A. ROBERT GINSBURGH

Department of Defense

WE are engaged in a great preparedness program. Stalin has had a big lead. Why doesn't he strike? Stalin probably has not struck up to this point because:

First, we have greater atomic supremacy and the ability to land atomic bombs anywhere in Russia.

Second, Russia must win and win quickly by a blitzkreig. If it is a long drawn out affair we are bound to win through our tremendous productive capacity.

Third, there must be industrial problems and transportation problems and shortages inside of that country. There may also be political difficulties inside Russia.

Fourth, Russia may be having a great deal of trouble with her satellites.

Fifth, it may be that the Russians are waiting for our economic system to break apart.

Sixth, still another hope perhaps on Stalin's part is that we will get tired and go back to our old ways as we did in other times.

After World War II the clamor to bring the men home caused an over-rapid demobilization of the military machine built up during the war.

We have a military situation that is fraught with danger. A plan to meet it is the result of study by the Joint Chiefs of Staff who have considered every possible trouble spot in the world and communicated to the armed services the things they would be expected to do in case trouble breaks out. The Army, the Navy and Air Force working together have developed a program which calls for 95 air wings, the equivalent of 23 battle divisions and 161 combat vessels as a minimum by June 30, 1952. Having satisfied the Joint Chiefs of Staff with this immediate requirement, the armed services were told they must prepare not only for '52, but for '53, '54 the years ahead and an all-out war at any time. Such long range planning calls for consideration of many possibilities and careful appraisal of the opposition.

At present we are using about 20 percent of our productive capacity in getting ready the kind of machine we need to deter war or win a war, should it break out. In 1944 we were using 40 percent of our production capacity, so there is still an important margin left.

Another requirement is to support our friends everywhere, especially the North Atlantic Treaty Organization nations. General Eisenhower is whipping those nations into a team. In the meantime, a minor war is going on and to those whose youngsters are being killed in Korea, this is just as much a war as an atomic war on all fronts.

Two trouble spots in which we are most concerned at present are first, Korea, and second, Egypt. In Korea it is important for us to remember the four things that we must insist on before we go along on any final truce agreement. First, we must have a military line we can defend. The 38th parallel is no such line. Second, we must insist, that during an armistice period there will be no reinforcements. Third, we are going to insist on a system of inspection. Finally, there must be an agreement about the exchange of prisoners. To date the United Nations have inflicted casualties running about 1,350,000 on the Chinese and North Koreans. There is a limit to what these people can take and they must ultimately admit defeat if we keep on knocking them out as fast as we have in the past.

Carl Marx once wrote, "The Russian bear is an animal that is capable of anything so long as the other animals he has to deal with are capable of nothing." Let's keep that always in mind.

Expanding Our Mineral Supplies— A Symposium

THERE are many people throughout the country who feel that the mining industry is gradually becoming a ward of government. Everyone who has had actual experience in Washington fully realizes that if the best interests of the country are to be served, the expansion of the mineral industry must be kept where it belongs. The role of Government is one of encouragement. It is the job of private enterprise, using private funds, to satisfy the nation's requirements.

* * *

Copper

By TOM LYON

Defense Metals Procurement Agency

THE civilian consumption of copper during 1950 was greater than any year in history. The per capita consumption in 1935-39 averaged 14.3 lbs. In 1950 it had climbed to 25.3 lbs. In that same year the United States produced 900,000 tons of recoverable copper; 651,000 tons were imported, and 474,000 tons were produced from old

scrap, the total being 2,034,000 tons. Of this, 138,000 tons were exported and 1,921,000 tons were consumed. Inventories of refined copper in producers' hands fell to the lowest level since 1906, 26,000 tons.

Domestic production of copper during the first half of 1951 was at an annual rate of nearly 960,000 tons but the third quarter strikes will probably reduce the total for the year to 940,000 tons, or slightly less. Imports during the first half were at an annual rate of only 500,000 tons a loss of nearly one-fourth of the 1950 imports. Production from old scrap will probably not be greater than 430,000 tons.

Immediately following World War II the United States usurped many of Europe's foreign supplies. Before World War II Europe consumed more copper than the United States and now that Europe is getting back on her feet a tremendous demand for metals is being realized. We can no longer figure on getting the bulk of the now known foreign production. Before our imports can satisfy our demands, additional mines and facilities will have to be brought into the picture. In addition to Europe's normal demand for copper the expansion and defense activities abroad will require more supplies of this metal.

During 1951 the United States can expect the total supply of about 1,870,000 tons of which 140,000 tons will be exported, leaving 1,730,000 tons for domestic consumption, which is nearly 200,000 tons less than was available in 1950.

By 1955 our copper industry is expected to have expanded to a point where an additional 225,000 tons will be produced. This will relieve the situation but not remedy it completely. Labor disturbances in several large producing countries, transportation, lack of power at some locations and other factors are responsible for the lag. The general price freeze which prevented copper prices from rising, while those abroad had already advanced have placed the United States at a competitive disadvantage. Primary producers in the United States were at a disadvantage because it was necessary to gear the purchases of scrap to the ceiling price for electrolytic copper. Other users purchased scrap at prices in excess of those for new metal. Uncertainty over action on the copper tariff and the agreement between the United States and Chilean Governments raising the price of Chilean copper to three cents above United States ceiling price, which resulted in a two-price system, also caused confusion in the industry.

In spite of anything we can do the copper picture does not look good for the coming two years at least.

Lead-Zinc

By OTTO HERRES

Vice-President

Combined Metals Reduction Co.

A WORLD-WIDE shortage of lead and zinc is now going into its second year and if the demand continues heavy and increases, as predicted by Washington defense officials, the shortages will probably continue for another two years. Under these circumstances industry will be able to bring supply into line with requirements by 1953, provided that production is not restricted by Government regulations and controls, and expansion projects requiring certification, allotments of materials and equipment, and contracts for production are not delayed greatly by the defense agencies.

Recent reports from Washington indicate that zinc requirements of the free world exceed refinery and smelter production by approximately 110,000 tons for the last three months of 1951. Lead supplies are critically short in this country, but fairly adequate for requirements elsewhere. For this reason, and because lead is not considered a critical defense metal to the same extent as zinc and copper, lead has not been under consideration for allocation at the International Materials Conference.

Important projects under way for new and expanded production of zinc will bring in an additional 110,000 tons of zinc annually from domestic sources. The only important planned domestic expansion for lead is one which will bring increase in production of 35,000 tons annually by 1954.

National security requires a healthy mining industry with ample productive capacity and experienced working forces. The mining industry can overcome existing shortages and provide production for future needs if assured of constructive administration of the tax law recently approved by Congress and afforded at least the same consideration and advantages given by our Government to foreign properties.

Aluminum-Magnesium

By LAWRENCE LITCHFIELD, Jr.

Vice-President

Alcoa Mining Co.

PRODUCTION of aluminum in the United States is being expanded by 600,000 tons annually, an increase of 80 percent over the size of the pre-Korean industry. This expansion will be achieved through the building of new facilities and the expansion of existing facilities by the three established domestic producers, and by the proposed entrance of a newcomer into the aluminum-producing field.

Of the planned expansion, 52 percent, or 310,000 tons, will depend upon natural gas as the source of electric energy instead of water power, and energy for 85,000 tons, or 14 percent, will be generated by steam, using lignite as fuel for the first time in the history of the aluminum industry. Metal from this expansion program has already begun to contribute to the nation's aluminum needs and added capacity will come into operation between late 1951 and the winter of 1953 provided there are no further delays in obtaining needed steel and equipment.

Additional alumina, from which metallic aluminum is made, will be produced at a new plant to be built by the Aluminum Co. of America at Bauxite, Ark., with a rated capacity of 400,000 tons of alumina per year, and in addition to Alcoa's plant at Mobile and Kaiser's Baton Rouge plant.

Mines in Arkansas, Surinam, British Guiana and Jamaica will supply the 5,000,000 tons of bauxite needed annually to make the alumina for the expansion program.

The outlook for supplies of magnesium is much brighter at present than that for aluminum. Where the aluminum productive capacity will have been increased 80 percent over the pre-Korea output, the output of magnesium, which totaled 15,726 tons in 1950, will have been increased eightfold over that figure when the six Government-owned plants built in World War II and recently reactivated are in full production.

Total production of magnesium is expected to reach 122,000 tons, of which 98,000 tons will come from reactivated facilities and 24,000 tons from Dow Chemical Co.'s plant at Freeport, Tex.

Iron Ore

By R. T. ELSTAD
President
Oliver Iron Mining Co.

TO ATTAIN the steel industry's goal for 1953 of 118,000,000 net tons will require about 135,000,000 gross tons of iron ore as compared with this year's expected production of 120,000,000 gross tons. The iron ore industry is endeavoring to meet the raw material requirements by expanding production in active domestic ore fields, new foreign ore fields, and in the development of taconite.

In present working fields, the Lake Superior district of the U. S. expects to produce 95,000,000 to 96,000,000 gross tons this year, and will continue its role as the major domestic ore producer. Exploration and development of new foreign ore sources is making rapid progress.

Much progress has been made in the taconite fields of the Lake Superior district and under the most favorable conditions 15,000,000 tons of taconite product per year can be expected by 1960.

A comparison of the development of distant foreign fields with the availability of these domestic ores during war emergencies is being given proper and serious consideration. The costs of these foreign ore developments on commenced and completed projects, excluding the Venezuela Cerro Bolivar ventures, total roughly $300,000,000. For the development of taconites, an additional $115,000,000 are already committed. This estimated $415,000,000, considered only the beginning, is financed by companies in the industry to promote new ore sources. For years the iron and steel industry has maintained a record of dependability to this nation that remains unchallenged. It has never failed. It is the key to our industrial strength and to our potential military might. The industry will continue to fulfill its responsibilities and obligations to the people of this nation as long as we continue to have a sound and strong private enterprise system.

Sulphur

By Z. W. BARTLETT
Assistant General Manager
Freeport Sulphur Co.

FOR THE first time in over 30 years the world is experiencing a shortage of sulphur, which is vitally needed in the current defense effort. The existing domestic sulphur shortage is attributed to greater demands from abroad, a rapid disproportionate increase in domestic requirements, and the relatively low price of brimstone which has tended to discourage the development of higher cost sources.

The American sulphur industry is exerting every effort to meet the sharply increased demands. As the result of years of prospect drilling, additional Gulf Coast brimstone production is now in sight.

At the beginning of 1951 there were seven salt dome sulphur mines in operation. By the end of 1953 at least four new deposits will come into production.

With defense production mounting, the sulphur shortage will probably get worse before it improves and the next 12 months may be a difficult period in this respect. Considerable encouragement can be gained, however, from the fact that among the free nations of the world some 46 new sulphur projects are under way to obtain sulphur from various sources. These new projects are expected to be capable of yielding a combined total of some 3,000,000 long tons annually by the end of 1953.

Of the above projects, 24 are in the United States, including the four salt dome brimstone mines previously referred to. Aside from the increased production expected from these new brimstone operations, the United States expects to obtain 350,000 additional tons of sulphur by the latter part of 1953 from natural gas, petroleum refinery gas, smelter gases, pyrites, and low-grade surface deposits. Similar recovery plants are being constructed throughout the world. In Spain, plans call for a rapid expansion of the pyrites industry and in Italy it is expected that production of sulphur from vast native deposits will be increased substantially.

Tungsten, Mercury, Chromium, Uranium

By IRA B. JORALEMON
Consulting Engineer

OUTLOOK for domestic production of mercury and chrome is discouraging, because domestic mines cannot compete with foreign sources in normal times. The present emergency has caused a temporary shortage of both metals but the return to miners is far too low to make up for increases in mining costs. Some mines, which made notable production during World War II, will be reopened, but the search for new orebodies of mercury will not be encouraged by the present price of $190 per flask. Chrome is in a worse state.

On the other hand, accomplishments in adding to domestic production of vitally needed tungsten are spectacular. Many new tungsten mines and mills are being opened and active exploration campaigns are under way for new orebodies. Save for the price floor that is of dubious value to most mines, and for a few exploration loans, the increase in domestic tungsten production and the promise of still greater future output have been brought about by private industry. The large investment has been made in spite of the fact that a resumption of trade with the oriental countries now under Communist control would force most of the domestic companies to shut down. Government agencies must give further assistance or price guarantees to justify equipping the new, large low-grade deposits. With such aid, domestic production can be brought up to the level of 1943 and 1944.

Progress in domestic uranium production has been highly gratifying. The most important result of the hunt for uranium ore has been to prove that the search is worth while from the point of view of private companies as well as of national defense. Orebodies have been found that are important assets even of the greatest companies that

are taking part in the search. Taking large and small operations together, the percentage of success has been at least as great as that in any other metal.

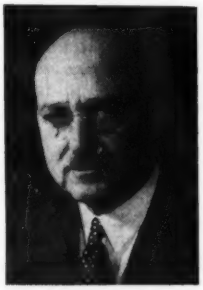
Developments have proved that uranium ore occurs in the western United States under widely varying geological conditions, and over a great area. Orebodies have been found from Montana to New Mexico and from central Utah to the east wall of the Rockies. Occurrences that have not yet been proved of commercial size and grade are distributed over a much greater area.

The wide distribution and the many different types of uranium ores should encourage a still more intense search by mining companies and individuals.

Titanium*

By GLOYD WILES

Manager, Mining Dept.
National Lead Co.



TITANIUM metal is in great demand. Formerly our greatest source was India but this supply has been cut off. In 1950 16 percent of the 668,320-lb supply came from Ilmenite. Of this 45 to 65 percent came from Tahawus, N. Y. Real output from Florida, California and Quebec has been realized and more is to come as newer techniques are developed.

* In Mr. Wiles' absence, this paper was delivered by A. R. Reiser, Assistant Manager, Mining Dept., National Lead Co.

The Manganese Picture

By S. H. WILLISTON

Vice-President
Cordero Mining Co.

CURRENT total supply of manganese is slightly in excess of consumption. Upon completion of the steel expansion program there will be no surplus and possibly a deficit. The U. S. position in manganese is a peculiar one. By far the world's largest consumer, this country, since 1890, has never supplied more than 10 percent of its requirements. It can probably not expect to do so on a commercial basis in competition with low foreign labor costs. On the other hand it has low grade reserves enough to treat 2,000,000,000 tons of steel at 14 lbs per ton.

Our chief supplier in 1948, Soviet Russia, no longer ships to us. Unrest in the Orient creates uncertainty over future shipment from India, which with the Gold Coast in South Africa has been the principal source in recent years.

A sound program to make us reasonably safe in manganese would require a few production-sized treatment plants and at least one plant in operation at each of the four or five important deposits in this country not thus equipped. To make this feasible much research and pilot plant operation remains to be done. The Bureau of Mines' preliminary program should be expanded and accelerated if we would avoid foolish risk. At home and abroad many companies are working on the problem of producing metallurgical grade manganese oxide and ferromanganese from known deposits.

Several exploration contracts have been cleared by Defense Minerals Administration for exploration projects in various parts of the country, but up to the present time there has not been much new activity among the small manganese operators.

Miscellaneous Minerals

By EVAN JUST

Editor
Engineering and Mining Journal

ALTHOUGH expansion programs in this group of minerals—phosphate, potash, fluorspar, antimony, cobalt, molybdenum, etc.—are of lesser magnitude than in iron ores, major nonferrous metals, sulphur, and titanium some of them represent impressive investments particularly in the cases of phosphate and potash.

New expansion programs in phosphate involve investments exceeding $25,000,000. The largest of these is a $10,000,000 project near Bartow, Fla., to convert rock into commercial phosphate products and to recover by-product uranium. The next largest is at the Tenoroc mine where the construction of a fluorine recovery plant will open the way to a new source of hydrofluoric acid. Other projects are under way at Brewster, Fla., in Wyoming, Idaho, Tennessee and Montana. All these phosphate developments are being made with private capital. Some have sought or obtained accelerated amortization. All of them will be completed in 1952.

New developments in domestic potash add up to an investment exceeding $28,000,000. All of them are near Carlsbad, N. M., and will be completed in 1952. These also are being financed privately.

Two important developments are in progress in domestic cobalt. The first shipment has recently been made from the Blackbird mine to Calera Mining Co.'s new mill at Garfield, Utah. This mill, with a capacity of 315,000 tons annually will produce 4000 tons of copper and 3,300,000 lbs of cobalt per year. This is a long step toward self sufficiency in this scarce and immensely strategic metal. This project is privately financed. A new refining process developed by National Lead Co. has been reported. This $5,000,000 investment was underwritten by the Government and Defense Materials Procurement Agency expects to obtain nearly 7,000,000 lb of cobalt, 9,000,000 lb nickel and 3500 tons of copper from this project during the next five years, even though completion is not expected until the Spring of 1953.

Sensible new activity in fluorspar seems to be a mine and mill expansion program in the Kentucky-Illinois field and in Colorado involving more than $4,000,000,000 of private money.

The Bradley Mining Co. has completed all major facilities at its Yellow Pine Mine and Smelter at Stibnite, Idaho, with a capacity of 5000 tons of contained antimony annually in oxide form. Defense Minerals Administration has announced exploration contracts with mining companies in Idaho and Arkansas.

Climax Molybdenum Co. is making substantial additions to its molybdenum and tungsten capacity but all details are under security secrecy.

Near Green River, Wyo., Westvaco Chemical Division, Food Machinery Corp., is erecting a refinery to produce soda ash. The new investment, all private funds, of $15,000,000 will go into a second production shaft and new mine development and the above mentioned refinery.

DMA has announced six asbestos exploration contracts and 19 mica contracts. Accelerated amortization certificates have been issued for nine magnesian projects involving private investments exceeding $11,000,000.

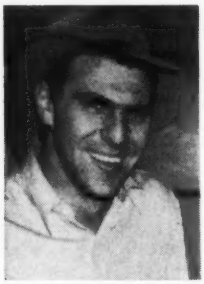
ROCK DRILLING

Session Chairman

GUY N. BJORGE

Vice-President and General Manager
Homestake Mining Co.

Economic Limit of Lightweight Drilling Equipment



By A. J. ZINKL
Assistant Superintendent
Iron King Mine

THE KEY to better drilling economy in metal mines is in obtaining the best balance between size of machine, size of steel, and size of bit. This conclusion is based on the results of a dozen separate tests at the Iron King mine where several thousand feet of drilling was done with tungsten carbide bits and different combinations of drilling machines, steel, and bits. Three years ago the Iron King mine changed over to drilling with tungsten carbide bits and alloy drill steel and the tests were carried out to determine the size of the machine which would be most economical to use with these bits.

Upon completion of the tests, an analysis of costs showed that a 98 lb stoper with the ⅞ in. quarter octagon drill steel and the 1½ in. diam bit was appreciably better than any of the others tested. This combination differed from the Iron King's customary 116-lb. stoper, 1-in. steel, and 1⅝-in. diam bit. Results obtained with a 77-lb stoper were disappointing.

In conclusion, the test work resulted in a decision to replace worn-out 116-lb machines, with 98-lb machines and to convert steel and bits to the smaller sizes in the future.

Observations on the Lightweight Air Leg Drill

By R. W. ADAMSON
Ingersoll-Rand Co.

THE ADAPTABILITY of any rock drilling method depends on many things but they all boil down to one basic factor, cost—not the cost per foot of blast hole drilled but the cost of the final unit of production.

Old rock drilling practices have a habit of reappearing combined with important inventions like the tungsten carbide bit. The resulting system is heralded as new and enjoys a certain popularity for a time. Currently, the air leg drill is in style.

An air leg drill is essentially an articulated stoper and has wide application for drilling horizontal or nearly horizontal holes. Formerly the air leg was confined principally to drilling softer formations. With the advent of small tungsten carbide insert bits the use of the air leg drill has expanded into hard rock drilling application, not easily accessible to rigidly mounted machines.

There are two basic types of pneumatic feeds to air leg drills, also common to stopers. In the first the drill is attached to the air cylinder and moves with it, as in the conventional stoper feed. In the reverse feed the drill is attached to the end of the piston rod and the cylinder remains stationary. Both of these have advantages and disadvantages according to the type of use to which they are put.

Current improvements in air leg drill design include the use of aluminum alloy tubing for cylinder construction and newly designed mounting brackets for attaching the leg to the drill. The former reduces the weight approximately 18 pounds and the latter takes strain off the side rods of the drill and streamlines the assembly.

The trend to smaller drills and faster rotation speeds are the result of development of the tungsten carbide insert bit. Tests show that drills in the 45 lb and 55 lb class strike 2000 to 2200 blows per minute while drilling granite at 90 lbs air pressure. Drills with positively thrown valves show greater sustained efficiency than those with current thrown valves. Increasing rotational speed has proved to be sound practice with a small bit.

There is considerable controversy over up-stroke vs. down-stroke rotation on drills used with tungsten carbide bits. Each has its application in hard rock, up-stroke rotation is superior and in the broad range of friable ores down-stroke rotation seems to work better.

Strain on the chuck, originally designed for down hole work has led to the development of longer steel holders with ⅞ x 4¼ in. hexagon shank chucks. There is reason to believe that still longer shanks could be used to advantage and that the 3¼ in. chuck will soon be obsolete.

In selection of the type of bit to be used with the air leg drill there is also wide diversity of opinion. Several definite observations can be made in this regard. Large mines with extended workings, show a distinct preference for the detachable bit while some of the smaller mines prefer the integral construction and are willing to scrap the drill steel when the tungsten carbide is worn out.

In mining, cost must always be associated with its greatest component—labor. Any system which calls for more than ordinary skill or exertion will not find favor in American mining. There are particular applications where an air leg drill can be used with a minimum of effort and acquired skill, but in general it cannot equal an automatically fed machine mounted on a mechanically manipulated boom, or lightweight pneumatic column.

Based on observation at numerous operations there are certain deductions which can be drawn. These are: (1) Conventional drifters on screw columns have a doubtful future. (2) Lighter drilling equipment on light, quickly set up bars appeals to most mine workers. (3) Air leg drills with tungsten carbide bits are a valuable addition to rock drilling.

Air leg drills should be considered for stope drilling calling mainly for slab holes that do not require accurate placing. They are also ideal for drilling small development headings, flashing, trimming, drilling skip pockets and similar jobs. Air leg drills are excellent for operations with limited working capital and resourceful workers who should have means of doing fast and varied rock drilling.

Bit Experience in Hard Rock Drilling

By EARL M. HOLMES
Assistant Superintendent
Oliver Iron Mining Co.

DRILLING at an iron ore mine in northern Minnesota where the rock "is reputed to be the hardest rock that is regularly drilled in any commercial operation in the United States and the hard ore with which it is associated is only slightly less hard" entailed considerable experiment to find the best bit for the purpose.

Machines with fast, light blows, preferably with a cushioning effect such as is provided with a column-mounted reverse feed stoper, gave the best results. Preferred rods were 1-in. quarter octagon hollow steel with heavy threads, carefully made to form a tight fit. Bits of sufficient size to hold large enough tungsten carbide inserts to stand the hard usage are recommended. Bits 1¾-in. in diameter were used, as smaller bits did not stand up. These must be sharpened frequently for if they are dulled to a 3/32-in. flat surface, there is excessive chipping, cracking, and shattering of the inserts.

Back in the days of solid forged steel, a single machine used 164 pieces of steel to drill 16 in. on the day shift and 178 pieces of steel were used to drill 18 in. of hole on the night shift with the same machine. This is just over 10 pieces of steel per inch of hole.

The Soudan mine has been of interest to geologists from all over the world and has been a testing ground for much drilling and blasting equipment.

MANPOWER—LABOR RELATIONS

Session Chairman
ROY H. GLOVER
Western General Counsel
Anaconda Copper Mining Co.

Manpower for the Mines

By STEPHEN W. WOOD
Manpower Branch
Defense Minerals Administration

MANPOWER shortages such as hampered the production of strategic metals and minerals during World War II can be avoided in the present emergency. This can be done only if the industry itself acts promptly to utilize the services offered by the Government.

The mining industry needs (1) to keep key men on the job, (2) to recruit and train new workers as expanded production becomes necessary, and (3) to increase the skill of present workers. The Government is ready to help solve each phase of the problem, but it cannot do the job without cooperation from the industry.

Draft deferments and delays in the calling of reservists to active duty is an immediate problem and Selective Service officials and military authorities recognize the importance of metal mining. On more than one occasion, men already engaged in active duty have been released upon the joint request of the employer and the Defense Minerals Administration.

Military deferments can be obtained only if it can be shown that a man is more important to the defense program in his civilian job than he would be in uniform. Careful analysis of each mine's working force is advisable to spot the individuals whose call to active duty might interfere seriously with mineral production.

Having made such an analysis, lists of employes for whom delayed activation is sought should be transmitted to the Defense Minerals Administration. A detailed statement should be included regarding the importance to mineral production of each man on the list, together with the probable effect of his call to active duty. The name, rank, serial number, present position and location of each reservist should be given. Upon receipt of such lists, DMA will review the cases and the Administrator will transmit requests meeting the criteria of the Department of Defense to the proper military authorities with his supporting recommendations.

There is a general shortage of such professional men as engineers, geologists, metallurgists and chemists. The DMA Manpower Branch has begun establishing a roster of persons qualified in such fields as a start toward an inventory of men available.

To minimize the loss of mine, mill and smelter employes to other defense industries—an important factor in the manpower shortage during World War II—working and living conditions for workers and their families should be improved and the importance of metal and mineral production impressed upon them. If there is any reason to suspect that workers do not realize the critical demand for metals and the important part of each individual in their production, it is suggested that it is the obligation of management to see that this is brought to each worker's attention quickly and convincingly.

For recruiting more workers, which may become necessary before long, the aid of the U. S. Employment Service local office and the cooperation of labor unions should be enlisted. Advertising in localities where recruiting is to be done will help, and relaxing job requirements, experience, age and physical qualifications when possible, and arranging to transport workers from where they are hired to where they are to work will also be beneficial.

For assistance in training new recruits, the Bureau of Apprenticeship of the U. S. Department of Labor is a source of assistance to the metal production industry and should be borne in mind in any plans for personnel expansion or improvement of worker skills.

Wage Stabilization Policy

By DR. CLARK KERR
Director, The Institute of Industrial Relations
University of Southern California

SPEAKING as an ex-member of the Wage Stabilization Board, as a private citizen, and as an economist, I should like to touch briefly on five points. First, on the military situation from an economic point of view; second, the pro-

duction requirements which grow out of the economic-military situation; third, the price and wage level implications of these production requirements; fourth, a review of where we have been since Korea in the field of prices and wages; and fifth, the current situation and the prospects for the next couple of years.

There is no question at all that the United States and her western allies could in the long run win an all-out war with Russia and its supporters. The national income of the U. S. and its allies triples that of Russia and her satellites. This tremendous industrial potential is a great deterring factor without which we might very well have been in war already, but industrial potential is not mobilized strength.

Statistics indicate that Russia is currently spending about 20 percent of its national income for war preparation. Ten percent of our greater potential industrial strength can more than match their 20 per cent. Temporarily however, in order to catch up we must devote about 20 percent of our national income to defense. This we must do over a two-year period from the Fall of 1951 to the Fall of 1953. Then, all things being equal, we can drop back to a ten percent level which we can well maintain permanently. Twenty percent of our national income may seem like a large figure, but in World War II the United States devoted 45 percent of its national income to the war, and Great Britain at its peak was devoting 51 percent.

These production requirements will inevitably lead to continued inflation because we have entered this period with little or no unemployment and industry operating at peak rates. This means that some civilian production must be converted to military, leaving less goods and services for the civilian population. This, together with a substantial increase in purchasing power which will not be adequately offset by increased taxes or increased savings will be the cause of the inflationary problem during the next two years. When controls were put into effect, they did not stop inflation itself but stopped the anticipation of controls and thus slowed the inflation somewhat.

The Defense Production Acts of 1950 and 1951 were not good instruments for stopping inflation in this nation. It has been charged that under the Act the Wage Stabilization Board was trying to apply to labor tougher policies than were being applied to other segments of the American economy. This was probably true. To have policies to stop inflation is correct, but it is impossible to stop it in one field alone. Parity for farmers and the pass-through of increased costs for manufacturers and percentage margins for retailers are, in effect, escalator clauses. Labor insisted on equal treatment and has received it. It is therefore impossible to stop any real inflationary pressure with the policies developed under the Defense Production Act of 1950 and '51.

Why have controls at all then? There are two good reasons: First, loose as they are, the controls do stop individual runaway situations; second, the controls do make available machinery, which it takes time to create, that would be necessary should a sudden all-out war develop. We have the machinery, we can always change the policy.

We in the United States are going through a difficult period. We are not at peace, and we are not at war. We must avoid inflation at any cost.

During the next two years we have the twin jobs of mobilizing effectively and maintaining the value of the dollar. There is no economic reason, given the proper effort by the various segments of our economy, why we cannot meet this challenge successfully.

Wage stabilization is no permanent substitute for collective bargaining

Trend of Recent Contract Negotiations

By LYMAN M. TONDEL

Member

Cleary, Gottlieb, Friendly & Hamilton

INFLATIONARY LABOR settlements in the copper industry are the responsibility of the Federal Government. The Wage Stabilization Board muffed the chance in the vital Garfield (Utah) copper smelter of the American Smelting and Refining Co. wage case to speak out against broad exceptions to its sound general rules. If stabilization is to work, the Wage Stabilization Board must show greater courage in advocating its own policies.

As a result of the past summer's labor negotiations, the left-wing Mine-Mill Union has gained power, with the unintentional help of the Government, even though in 1950 the C.I.O. Investigating Committee found that the Mine-Mill leadership was directing its policies toward the achievement of the program and purposes of the Communist Party. Government and industry is warned to beware of Mine-Mill's proven power to strike the non-ferrous industry and its power to sabotage mining operations.

The Steel Workers are in the non-ferrous industry to stay—provided they learn how conspicuously naive it is to regard the rural, western, fragmentized, non-ferrous industry as comparable to the citified, integrated eastern steel industry which relies almost entirely on domestic ore.

Last summer's negotiations showed how desirable it is for Government to have a variety of powers to deal with national emergency strikes rather than just one set procedure.

Ready markets and high prices may not continue when the rearmament program ceases. Companies should prepare themselves to adjust wage costs quickly, and as harmoniously as possible, in order to keep properties going when prices are lower and markets are thinner.

Finally, however necessary stabilization is today, it is no permanent substitute for collective bargaining. May we be able to get back to that free enterprise manner of doing business as soon as possible after the crisis has ended.

Salary Stabilization Board

By E. C. ALVORD

Alvord and Alvord

WHEN it was wisely decided that salary policies should remain under the control of management, determined voluntarily and not through compulsion, the Salary Stabilization Board was organized to take over the function of the Wage Stabilization Board with respect to salaried supervisory employes and executives. The logic of the Board's approach is this. To stabilize prices, wages must be stabilized, and if wages are stabilized salaries also must be stabilized.

Following this logic the basic policy of the Board has been defined about as follows: (1) The historic relationship between wages and salaries should be preserved; (2) management knows more about fixing salaries than any government agency can; (3) stabilization of salaries should be done at the discretion of management and without interfering with the private enterprise system.

These simple policies start in from a general freeze on salaries.

Any salary increase that violates the following rules is probably a violation of the law. However, any salary increase which complies with these rules, can be made without consulting the Salary Stabilization Board: (1) Merit and length of service increases in salaries are subject only to one limitation. Such increases must be budgeted on a total of six percent of the salary pay roll and no man can get more than ten percent a year.

(2) Bona fide promotion, certified by a responsible officer of the employer, may be made without recourse to the Board.

(3) Adjustment of compensation for a regularly increased work week for foremen and supervisors may be made as in the past.

(4) To maintain historical differential between compensation of foremen and supervisors and that of those whom they supervise pay raises may be made, without recourse to the Board.

(5) Bonuses may be paid so long as they do not exceed the 1950 bonus or an average of a three-year base period.

Regulations covering the so-called fringe benefits, will be covered shortly.

It is hoped that from 80 to 95 percent of salary stabilization problems will be settled without consultation with the Salary Stabilization Board. Only the problems of newly established industries and those who wish to change their past practices are the ones that will have to come to Washington. Those two problems are pretty tough, but for the rest of them we hope you can stay at home, run your plants, fix your salaries as you want to fix them, and do a job.

Freezing of Quicksand Employed in Sinking PCA Shaft

By RUSSELL HAWORTH

Resident Manager

Potash Co. of America

A HUGE section of watery quicksand earth 31 ft in diameter and 360 ft deep was frozen solid so that a ventilation shaft could be sunk to a potash mine in New Mexico.

After two shafts were started on the New Mexico property in 1947 and both encountered water and quicksands which resisted all efforts to complete the jobs, work was suspended pending further investigation. During several weeks spent in England, France and Belgium to study the freezing method, and consultation with engineers who had experience in this field, and examination of technical articles on the subject, it was decided that the safest and cheapest method of conquering the quicksands would be to freeze the shaft zone before sinking. Test holes were drilled around one of the two shafts which was selected for the experiment.

Around the circumference of a 31-ft diam circle, 28 holes were drilled. These holes, eight in. in diameter, were drilled about 360 ft deep, to just below the deepest water-bearing formation of unconsolidated sand and silt. In each of these holes was placed a six-in. pipe, welded in string and sealed at the bottom. Inside it was run a two-in. pipe. A refrigeration plant was erected on the surface and connected to the system. Cold brine passed down the small inside pipe and returned to the surface at a slower rate through the six-in. casing. Seven days after the operation was started, the temperature at the bottom of the holes was six deg. F. Cylinders of ice formed outside the six-in. pipes where water was present. Complete closure of the ice shell around the shaft was completed in 48 days from time of starting the brine circulation.

The quicksands were thus immobilized and the sinking of the 15-ft ventilation shaft was effected with conventional equipment and methods.

Water Problems in Shaft Sinking At Friedensville

By FRED D. WRIGHT

Senior Mining Engineer

U. S. Bureau of Mines

ROBERT L. LOOFBOUROW

Manager, Mining Dept.

and

FRANK J. KANE

Superintendent

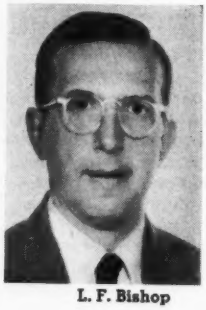
E. J. Longyear Co.

THIS paper appeared in full in the November issue of MINING CONGRESS JOURNAL.

Andrew Sims

Concreting the Kelley Shaft

By ANDREW SIMS
Assistant General Manager
and
LESTER F. BISHOP
Assistant Research Engineer
Anaconda Copper Mining Co.



L. F. Bishop

WITH the largest cross sectional area of any shaft in the Western Hemisphere, the Kelley Shaft of the Anaconda Copper Mining Co. at Butte, Mont., is so constructed that it will give many years service with a minimum of maintenance expense.

With a cross sectional area of 38 ft by 9 ft, the Kelley Shaft was sunk to reach low-grade copper orebodies in the Butte district where about 130,000,000 tons of ore had been proven. Compared with the average daily capacity of about 2000 tons of ore for other Butte shafts, the Kelley Shaft is designed to produce between 10,000 to 15,000 tons of ore every 24 hours.

After sinking and timbering the shaft, the concreting operation proceeded upwards in all cases. When a set of timbers was removed and the reinforcing rods and steel forms installed, the concrete was poured from the surface through a vertical pipe line. Over 5000 cu yd of concrete have been poured in this manner with no separation of the aggregates. Concrete bulkheads have been poured in the Butte mines where the concrete has traveled 2860 ft through the vertical pipe line, with no separation of aggregates. It required 40 sec for concrete to travel this distance down the pipe line.

Based on company records, the concreting cycle was about 22 hr, including four hr to remove timbers, four hr to place pre-fabricated reinforcing steel, 10 hr to hoist and align forms, and four hr to pour the concrete.

South African Shaft Sinking Methods

By GORDON S. DEVILLIERS
Orange Free State Gold Mining Co.

A NEW technique for sinking concrete-lined circular mine shafts has been developed at two gold mines 150 miles southwest of Johannesburg in South Africa.

Three successive world records were established this year in the application of the method—described as continuous sinking and concreting—to one of the mines, the Virginia No. 3 Shaft. These records were:

March, 1951—470 ft sunk and concrete lined.
April, 1951—504 ft sunk and concrete lined.
May, 1951—389 ft sunk and concrete lined.
(Station fully excavated and concrete lined.)

Chief feature of the new method is a double-deck sinking platform which can be moved up and down the shaft to set the circular steel rings, guide the pouring of the concrete, and facilitate the performing of other necessary operations.

In addition to attaining the desired results and speed in sinking and lining the shaft, the new method also has proved safe, and confidence of company engineers that the safety of persons at the shaft bottom would not be endangered has been fully justified. During the seven months that this scheme has been in operation, not a single man-shift has been lost due to an accident that could be attributed to this method of working.

The shaft is 24 ft 1 in. in diameter inside the lining. The circular shaft was deemed best because of the nature of the earth and water-bearing formations through which the shaft had to pass. The circular shaft also has great inherent strength and lends itself to a more effective application of the cementation process.

Remarks on Shaft Sinking at San Manuel

By J. F. BUCHANAN
Mine Superintendent
Magma Copper Co.

TWO shafts were sunk to depths totaling 3558 ft at the San Manuel operation of the Magma Copper Co., Superior, Ariz. The No. 1 has been sunk to 1494 ft, and the No. 2, has been completed to 2064 ft. The company had to install a complete camp including power plant, machine and electric shops, boarding house, dormitories, etc.

To be used for hoisting ore, the No. 1 shaft is a four-compartment shaft, ground supported and lined with reinforced concrete. Its section required a rock excavation of 9 by 28 ft and is in barren quartz monzonite. The company sank and concreted 1338 ft of the shaft at the rate of 107 ft a month, 3.56 ft a day, or .198 ft per man shift. Dry sinking averaged 120 ft per month; wet sinking averaged 74 ft per month. The best speed was from the 500 to the 800-ft depth, where in two months they sank and concreted 310 ft, or 5.25 ft per day.

Sinking in wet portions of No. 1 shaft meant contending with a 900-gpm flow of water. This was intercepted at 48 ft intervals through installation of water rings or troughs and the collected water pumped up the shaft with 300-gpm centrifugals.

Number 2, a three-compartment shaft requiring a rock excavation of 8 by 21 ft, is solely an exploration shaft and the upper part will be lost soon after production starts. Because no adequate sinking hoist was available at the time the operation was started, the first 400 ft was sunk with a small air hoist and was hand mucked. The remainder was sunk with a 225 hp double drum clutched hoist.

The rate of sinking of the No. 2 shaft was 110.5 ft per month, 3.68 ft per day, or .307 ft per man shift. The best month was 138 ft.

It is interesting to note that three percent of the sinking time was spent in constructing water rings, installing louver boards and ring pumps to protect the men from the pounding of falling water.

At the time the shaft was completed pumping required one sinker pump in the bottom; two surge tanks and four 500-gpm centrifugal pumps on the 1900-ft level; two surge tanks and four 500 gpm pumps on the 1600-ft level; storage sumps and four 650-gpm centrifugals on the 1300-ft level and four 650-gpm pumps on the 800-ft level. All transformers and starters for these pumps are on the 1300-ft level electrical substation. Water from the rings flows by gravity to the surge tanks on the level below.

PUBLIC LANDS—TAXATION

Session Chairmen

PAUL B. JESSUP

Vice-President

Day Mines, Inc.

and

HENRY B. FERNALD

Loomis, Suffern & Fernald

Do the Mining Laws Impede Resource Development?

By A. O. BARTELL

Managing Engineer

Raw Materials Survey

DETAILED STUDY of the U. S. mining laws in relation to the development of the natural resources in Oregon shows conclusively that the laws themselves do not impede full utilization of resources other than mineral, such as timber and recreation, but that in many cases abuses of the mining laws have offered an impediment.

The outstanding example, a 60,000-acre "timber grab," made front-page newspaper headlines. This parcel, 90 sq mi covering some of Oregon's most valuable timber lands, was staked as association placer claims in a geologically unfavorable area. The head of the association is a lumberman who owns a sawmill. Value of the timber involved is conservatively estimated at over $30,000,000.

The real danger does not lie in the fact that these abuses are to some extent holding up resources development. The danger is that the Interior Department's Bureau of Land Management, instead of vigorously enforcing the mining laws in order to correct the condition, is widely publicizing these cases and throwing the blame on the "archaic mining laws dating back to 1872."

With the apparent goal of complete control of the surface of all public lands under its jurisdiction the Bureau of Land Management has found, in Oregon, a relatively receptive atmosphere to promote a clamor by an aroused public for changes in the basic mining laws. The mining industry in the state is statistically insignificant. Only 0.3 percent of the wage earners are employed in mining activity, whereas 30 percent derive their livelihood directly from timber resources, agriculture, and fisheries.

It is emphatically evident that the negligible amount of land patented as mining claims in the State of Oregon can constitute no threat to the development of natural resources other than minerals. It is also perfectly evident that most of the abuses to the public domain, in the name of mining laws, are not in the main due to loopholes in the mining laws, but dereliction of the Bureau of Land Management in its duty conscientiously to enforce the mining laws.

It is urged that mining men attending this convention adopt a resolution recognizing that there are abuses of the mining laws detrimental to the public interests and demanding that the Bureau of Land Management stop these abuses by consistent enforcement of the mining laws.

What the Future Holds Taxwise

By ELLSWORTH B. ALVORD

Alvord & Alvord

"WHAT the future holds taxwise" is not a tax problem. Our tax policies are not based solely on tax considerations. Every fiscal policy of the present administration is creating more inflation than all the controls and all the taxes can possibly stop. The idea of stopping inflation by draining off excess purchasing power through increased taxes is like trying to stop floods by increasing the flow of the headwaters. It is the fiscal policy of the Federal Government that creates inflation.

Before further taxes are considered a complete review of our fiscal policy by Congress and institution of controls on Federal spending should be demanded by the people, lest our fiscal officials bring us into uncontrollable inflation. An examination of our spending policies will reveal a great deal. This fiscal year's expenditures will amount to about $70 billion, perhaps a little less. Revenues will be about $3 billion more than Treasury estimates and there will be no cash deficit. But we are becoming committed to a terrific spending program for next year. The latest tax law was passed with no official estimate of expenditures for the fiscal year ending June 30, 1953; unofficial estimates of expenditures range as high as $80 to $95 billion. Now let me suggest a sort of simple spending policy. That which is necessary for defense, let's spend. That which is not necessary for our defense, let's save to the fullest extent possible. Such a policy wouldn't harm a single essential function of the Government and might even promote the defense effort.

On the world front, for almost a generation we have been embarked upon international policies to promote peace. During that period we have had two world wars and may be facing a third. There must be something wrong with those international policies. Part of what is wrong can be related to our spending policy. Five years ago ECA was created as the savior of the world by June 30, 1952. Now, the outlook for the future seems to indicate a permanent ECA under different initials perhaps, or a different name. If ECA were to end this fiscal year the cost to the nation might be as much as $16 billion. This suggests another policy, one under which we learn to appraise how big a burden we can carry without foundering, and not attempt any more than that.

Returning to the topic at hand, no increases in income or excess profits taxes are likely, solely because mathematically Government is already taking close to 100 percent. The excess profits tax, passed as a temporary measure, should be repealed. What this tax actually does is prevent expansion of productive capacity. If it were devised to promote development and increased capacity, it wouldn't raise revenues.

Normal taxes on normal profits have risen to over 50 percent. Where they will stop is impossible to say. Capital gains taxes, likewise, are on the way up.

If the trend toward socialism continues, all taxes will increase. If international policies are not reformed, "Dollar Diplomacy" will continue. Already Europeans are afraid of us, militarily, politically and financially. We should develop an international policy based on mutual confidence and friendship, not on the dollars we hand out.

Proposed nationalization of mining has been defeated in the past. It will be again in the future. Taxwise, the future depends on the sort of Government fiscal policies the voters insist upon. Determine what policies you will demand and the sort of fiscal policy to support such an economy can be mapped out.

The Revenue Act of 1951

By HENRY B. FERNALD
Loomis, Suffern & Fernald, N. Y.

LAST January the President asked immediate action to raise $10 billion for taxes anticipating later action to raise additional billions. Subsequently the Revenue Act of 1951, estimated to raise an additional $6 billion in a full taxable year was approved. This Act raises the tax rates on individuals and corporations and imposes some new and some increased excises. Corporate income taxes,—normal and surtax,—are increased to 52 percent. Individual income taxes are increased generally 11¾ percent of prior normal and surtax rates or 9 percent of the amount of surtax net income remaining after prior taxes, whichever is less.

Excess Profits Tax rate remains 30 percent, but the maximum Excess Profits Tax shall not exceed 18 percent of the Excess Profits net income (17¼ percent for 1951). Excess Profits credit is reduced from 85 to 83 percent (84 percent for 1951).

Congress has realized the need for greater production, development and discovery of minerals. To lessen the tax blockade to that end the new Act includes the following:

Sec. 309 which provides that expenditures for development of a mine or other natural deposit (other than oil or gas) "after the existence of ores or minerals in commercially marketable quantities has been disclosed" will be (1) currently deductible in the year paid or incurred, or (2) at the election of the taxpayer, treated as deferred expenses deductible ratably as ores or minerals benefitted thereby are sold.

Sec. 342 which provides that exploration expenditures not in excess of $75,000 in any year will be (1) currently deductible in the year paid or incurred, or (2) at the election of the taxpayer, as to any portion thereof, treated as deferred expenses deductible ratably as produced ores or minerals discovered or explored thereby are sold.

Sec. 319 which increases percentage depletion for coal to 10 percent and grants percentage depletion to certain other minerals.

Sec. 325 which provides that coal royalties to a lessor are to be taxable at capital gain rates. There is no change in the treatment of royalties to the lessee.

Sec. 515 which adds sulphur, potash and metallurgical and chemical grade limestone to metal and coal mining properties as subject to the special provisions of Sec. 453 in computing *exempt excess output*.

Congress in this Act has done much to remove some of the tax obstructions to mineral discovery and development and production. It is hoped that the Treasury Dept. and the Bureau of Internal Revenue will endeavor, in administration, to carry out the intent of Congress.

Taxes and the Mining Industry

By HON. THOMAS E. MARTIN
Member of Congress from Iowa

IT has become increasingly necessary to develop tax laws that will aid in attracting capital to the mining industry.

The Revenue Act of 1950 adopted a provision similar to that in effect during World War II designed to provide incentives for engaging in defense work. Under the new law, an alternative is provided to depreciation deductions. Instead of writing off property over the useful life (or other basis) of property, taxpayers may elect to amortize the property over 60 months provided. (1) it was completed after December 31, 1949, and (2) it has been certified as necessary in the national defense.

In the Revenue Act of 1951 both the House and the Senate adopted provisions relating to the development of mines designed to provide certain incentives. The Senate adopted a provision to allow a limited deduction for mine exploration costs.

Under the law prior to the new 1951 Revenue Act, exploration expenditures could not be deducted but had to be capitalized unless they produced no useful results. There has heretofore been no special tax incentive for increased exploration expenditures.

Amounts paid by the United States to encourage exploration, development, and mining of critical and strategic minerals or metals for defense purposes are exempt from income and excess profits taxes. Corporations engaged in the mining of any "strategic mineral" are exempt from the excess profits tax on that part of their income attributable to such mining. In addition, there is exempt one-third of the net income of metal or coal mining properties, timber, natural gas properties not in operation 1946-1949, or a metal mining property operating at a loss during such period. The benefits of the exemption of one-half of the current net income of old mines and one-third of the income of new mines is extended to certain additional minerals, such as sulphur, potash, and metallurgical or chemical grade limestone deposits by the Revenue Act of 1951.

The National Minerals Advisory Council has asked for more liberal depletion allowances, a three-year tax exemption for new mines, a loss deduction for abandoned mines, and for a depletion allowance to stockholders.

There has been a persistent effort by many government officials to urge reduction or suspension of the tariff on metals and mineral whenever the opportunity has arisen to do so, and this matter must be watched closely.

Exploration Cost Should be Deductible

By L. J. RANDALL
President
Hecla Mining Co.

SECTION 242 of the 1951 revenue bill amends Sec. 23 of the Internal Revenue Code to permit the expensing of expenditures made for exploration incurred prior to the development stage. Such expenditures are limited to a maximum of $75,000 per year for a four-year period whether made on one or several mineral deposits. The taxpayer at his election, may either expense such costs or he may capitalize such expenditures to be written off over the life of the mine.

The bill does not permit the writing off of initial expenditures for acquisition of property or expenditures for equipment, buildings, and other depreciable items which must be acquired before exploration work actually commences.

Having made the initial expenditure for acquisition of the property, buildings and equipment, and after having made a further extremely heavy expenditure for actual exploration, not more than one out of ten, or perhaps one hundred, prospects ever becomes a profitable operation, then it becomes quite obvious that there must be an incentive for making such expenditures.

Our Administration recognizes the importance of mineral resources in the present national emergency. Unless new ore reserves are discovered through exploration, it is quite obvious that present ore reserves will soon be exhausted, and likewise that present income from mining operations will gradually decrease, with a resulting loss of revenue to the Federal government.

Due to the necessity for deep exploration, present-day costs incurred prior to discovery of commercial ore require heavy cash outlay. In the Coeur d'Alene District it is not uncommon to encounter ore at a depth of from 2000 to 3000 feet below the surface, which in some cases requires an expenditure in excess of $2,000,000 to prove the existence or non-existence of a mineral deposit.

The $75,000 limitation for expensing exploration costs should be eliminated. Under present-day conditions any taxpayer who is willing to gamble from $500,000 to $2,000,000 or $3,000,000 merely for the purpose of determining the existence or non-existence of a mineral deposit should have the right to either deduct the entire expenditure made in the year incurred or to recover such expenditure ratably over the period during which any ore encountered through such expenditures is mined.

Taxes and the Mining Industry

By S. H. WILLISTON

Vice-President

Cordero Mining Co.

OUR tax program over the past 15 years makes it almost impossible for anybody with any economic sense to explore for and develop new mines. The philosophy seems to be that, it is quite alright to let the taxpayer take the risk and absorb all the losses while Government receives something between 75 and 97½ percent of the returns from any successful ventures. By encouraging imports to the greatest extent, domestic production was discouraged in line with the policy, expressed by some, that it would be best to keep all of our domestic minerals in the ground. Such a policy is unrealistic. It does no good to have the minerals in the ground when we have only a vague idea of where they are, no information on size or grade of deposits, no manpower to operate the mines should this be necessary, and no machinery or mills to handle the ore.

With the next five months the consuming part of the industrial United States is going to ask why there is no lead, zinc or cobalt, or any of the half dozen other things necessary so they can stay in business. They are going to have an interest in the mining industry that they have not had over the last 15 years.

In the last tax bill the first faltering steps were taken to make it worth while for an explorer to go out and look for a new deposit. This is not going to be enough. Until Congress accepts the necessity of a depletion allowance to the stockholder as well as to the corporation, exploration for new deposits will not reach the levels necessary to maintain the production of the industry.

Many of the "planners" in Washington believe that Government must and will do the necessary exploration. Progress to date, or lack of it, is mute evidence of the success of such a program.

Comments on Taxation and Inflation

By D. H. McLAUGHLIN

President

Homestake Mining Co.

WE need to give attention to tax matters for the nature of our industry requires most careful vigilance, not to secure special privileges, but to see to it that profits from mining operations are properly determined, with recognition of all that goes into the costs of finding and exploiting an orebody as well as adequate allowance for the depletion of the basic asset (the ore itself) as an enterprise progresses.

The mining industry is not and has not requested special favors.

The two major economic evils that oppress American industry and the entire nation today are (1) excessive taxation and (2) inflation.

As long as expenditures are at the present fantastic level, we can only expect that these twin plagues will continue and will become a more and more debilitating affliction on the economy and on the social order.

Both are certain to continue to be imposed on us until their basic cause is effectively dealt with. If they are to be controlled and checked before their effects become utterly disastrous, it must be by correcting the primary evil by elimination of unnecessary spending and by imposing proper efficiency in the activities carried on through governmental agencies. Until this is done, efforts to restrain inflation through controls, freezes, stabilization, etc. —even through restoration of the gold standard—are certain to prove futile. Taxes will be pushed higher and imposed in new forms as the pressure for more money rises.

Together with the rest of the industrial world, the mining industry faces the prospect of having more and more of its earnings diverted to the government, with the eventual socialization of the economy through effective control of profits on which returns on investments, growth, and the stimulation of new ventures depend. Socialism, based on captive corporations with earnings largely diverted to the hands of the political rulers, is merely a varient of the general scheme that has developed under our particular economic and political system.

With appropriations now so great that the spenders are hard put to it to reach the authorized rate, it may be later than we realize

Faced as we are with dangers brought upon us by the inept leaders who threw away the hard won and costly victory that closed World War II, we must again provide vast sums for armaments even before we have made a start on settling the cost of the previous conflict and repairing the destruction it created.

To oppose increases in taxation these days exposes one to the charge of lack of patriotism and of aiding the forces promoting inflation.

Merely to meet every demand by more taxes—including those made on the grounds of military necessity and patriotism—simply provides more and more money to spend uncritically. Under present circumstances, with a government free to manage the currency for its own ends, control over taxation is about the only power still in the hands of the representatives of the voters. And they must exercise it if our social order is not to be transformed.

MECHANIZED MINING

Session Chairman

W. C. BROWNING

Western Representative

Gold Fields American Development Co.

Large Scale Mechanical Mining of Gravel Deposits in Southern California

By RONALD C. GRIFFIN

Production Manager

Consolidated Rock Products Co.

THIS paper was published in full in November 1951 issue.

Heavy Duty Haulage Trucks on the Mesabi Range

By R. W. WHITNEY

General Manager, Minnesota Mines

M. A. Hanna Co.

PRIOR to 1937 all ore and overburden in Mesabi open pits was done with locomotives and cars. In that year the first heavy duty off the highway truck made its appearance on the Range. During 1950 trucks handled 84 percent of the stripping and 64 percent of the ore hauled.

The number of heavy duty trucks has grown from zero in 1937 to 1200 in 1951. The first trucks were 15-long ton capacity powered with 150-hp diesel engines. These were loaded by 120-B shovels carrying a 4½-cu yd dipper. In 1948 the first 30-ton trucks were put into service powered with two 190-hp engines each and loaded with a 170-B shovel and six to seven-cu yd dipper. Indications are that eight to ten-cu yd shovels will soon be used to load 45-ton trucks each powered with two 300-hp motors. They require 380 hp for efficient operation and in some cases this is achieved with a single 400 hp engine. The fuel used is either diesel oil or butane gas. The engines now almost invariably drive the wheels through single stage torque converters with multiplication capacity of about three to one. Every truck is hydraulically steered.

It costs about 16 percent more ($8.20 per hr compared to $7.50) to operate the 30-ton truck than the 20-ton unit, but the former has 50 percent more carrying capacity. In addition, the 30-ton unit can outperform the smaller truck on grades, on the level and possesses superior riding qualities.

On roads, whose limiting grade is eight per cent, great care is expended in maintenance. Most companies also have elaborate preventive maintenance programs for the trucks. These include periodic overhauls and daily checks. Each truck driver is educated in proper care and handling of his truck before being assigned a place in the working force.

Over the years technical advances in manner of use and in trucks themselves have made possible operation of many pits too narrow, and deep for older methods. This has prolonged the life of the Mesabi Range and kept mining costs per ton close to the 1940 level. If truck efficiency continues to increase at the same relative rate that it has in the last 14 years, many properties now considered unworkable will be producing ore at a profit.

Improvements in Blasthole Drilling in Open Pit Mines

By ROBERT W. BELL

Assistant Superintendent

Erie Mining Co.

STARTING in July 1950 concentrated efforts have been made to apply jet-piercing methods to primary blasthole drilling in the very hard ores at the preliminary taconite plant of the Erie Mining Co. at Aurora, Minn. Up to the end of August, 1951 a total of 25,000 lineal ft were thus produced. This was done with the JPM-1, the first commercial jet piercing machine made and the only one in production to date.

High velocity flame jets produced in a rocket-type burner by the combustion of oxygen and kerosene or fuel oil consume 10,000 cu ft of oxygen and 40 gal. of fuel per hr. A temperature of about 4300 deg. F. and a jet flame velocity of up to 6000 fps are the result. These jets are brought to impinge on the rock surface rapidly raising the temperature of a thin layer and by the differential in expansion cause it to spall and break away. To prevent the combustion chamber from being consumed by its own heat; to quench and embrittle the spalled material and to provide steam to help carry the fragments up the drill hole, water is introduced along with the fuel and oxygen into the blowpipe. This consists of a swing joint, burner group and the Kelly—a long seamless steel tube 4½ in. diam. Depth of hole is controlled by the length of the Kelly, the present depth being limited to 31 ft. The method is particularly applicable to siliceous rock, like chert and quartzite.

Success or failure in taconite mining depend largely on efficient drilling and blasting of this hard abrasive material. Not only is this a costly phase of operations, but efficiency of following steps depends upon an adequate supply of well fragmented material.

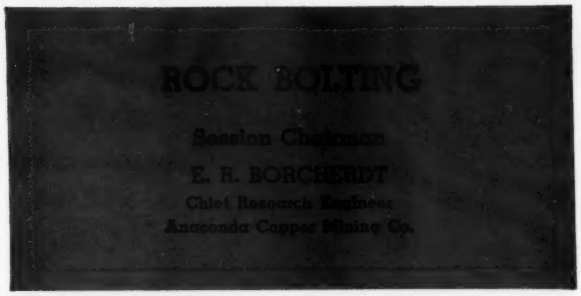
Mechanical Mining in Nonmetallic Mines

By H. L. GARDNER

Mine Engineer

International Minerals and Chemicals Corp.

SEE page 30 of this issue for complete text.



Lloyd Pollish

Rock Bolting Experience at Butte

By LLOYD POLLISH
and
ROBERT L. SANDVIG
Engineering Research Dept.
Anaconda Copper Mining Co.

R. L. Sandvig

ROCK BOLTING was started experimentally in 1939 and 1940 and was applied to the Butte Granite in the Belmont Mine. About 1000 bolts are used each month in the Butte mines since it was proven that they are just as applicable to igneous as they are to stratified rock. The effect of well-placed rock bolts in igneous rock is to lock the individual loose rocks into a self-supporting masonry arch. In general, any excavation which is surrounded by a competent rock structure, firm enough to anchor a wedge type bolt, can be secured with rock bolts. Another advantage is that rock bolting is adaptable to any shape of excavation, while with timber, the shape of the excavation must conform rigidly to the shape of the timber sets. Furthermore, in haulageways, from 22 to 37 percent more rock than a minimum cross-section requires has to be removed to make room for timber.

Light timber, gunite, steel mats, or heavy mesh fencing are often useful in distributing the supporting strength of a rock bolt over larger areas than a steel plate washer will cover.

Pull tests show that one-inch diameter wedge-type bolts with burned slots and cut threads usually break in the threads at from 20 to 24 tons pull rather than slip from their anchorage, which is held in the hole by a wedge in the slotted end. Pneumatic impact wrenches are highly recommended for tightening the nuts on rock bolts, because they are fast and assure adequate tightness.

Rock Bolting in the Keyhole Diversion Tunnel

By KIRK H. FOX
Partner
Gates & Fox Co.

WHEN Gates & Fox started to drive the Horseshoe Diversion Tunnel for the Bureau of Reclamation at the Keyhole Dam in Wyoming, difficulty was experienced in getting the portal started. After surface excavation for the portal was finished, it was found that the entrance was in badly fractured ground. If this material could not be held in place, making a sound entrance would be extremely difficult.

Having seen the excellent results accomplished with roof bolting in some coal mines, it was decided to try this method to bind the ground together and make it self-supporting.

Bolts 8 ft 4 in. long were installed at the portal holding the fractured material in place and allowing an entrance to be accomplished with the minimum of overbreakage. The success of this operation convinced the engineers of the value of the bolts, and they continued to use them in six-ft lengths throughout the tunnel to support the roof.

As a result of this experience, the following conclusions were drawn:

(1) Roof bolting is an excellent procedure for portaling in fractured and blocky ground.

(2) In types of ground where the bolts can reach solid strata, they have a definite place in supporting tunnel roofs.

(3) Roof bolting is faster and more economical to install than timber or steel supports, and also keeps the working space clear.

(4) Employes have an additional feeling of safety when working under bolted areas.

Rock Bolting—Kokomo Unit, Colorado

By S. E. ZELENKOV
Superintendent
American Smelting and Refining Co.
Kokomo Unit

BEGUN as an experiment in July, 1949, roof bolting in the Kokomo lead-zinc mine, operated by the American Smelting and Refining Co. in the Leadville district of Colorado, was so successful that it was used until the mine was worked out and shut down in 1950.

During the period from July, 1949, to January 31, 1950, over 1,000 bolts were used in the mine. They were tried in five stopes of which 8-M was the largest, containing 450 bolts. This was the downward extension of the old 800-ft level stope which was mined out down dip and completely caved in 1948.

Among the conclusions drawn were:

(1) The opportunity to observe the action of roof bolts under excessive loads, such as were in effect in the 8-M stope, resulted in a strong conviction that roof bolting is applicable to many cases of hanging wall support.

(2) Far better safety conditions were indicated in the roof bolted stopes, and no lost time accidents were recorded for over 15,000 tons mined.

(3) Decrease of dilution from hanging wall caving is also of importance.

(4) Additional emphasis may be placed on advantages of roof bolting by referring to production figures in the main Kokomo stopes for seven months, with 11.11 tons per man shift production, compared to 5.70 tons elsewhere in the mine, and the contract price of mining was reduced some 20 percent under certain conditions.

The cost of roof bolting was $0.135 per ton mined. This is one-fourth the cost of timber supports, excluding installation cost, used in the other stopes.

Roof Bolting at U. S. and Lark Mine

By BENTON BOYD
Superintendent
U. S. and Lark Mine
U. S. Smelting Refining and Mining Co.

BEGINNING in 1950, more than 1,500 bolts have been installed in the Lark Section, U. S. and Lark Mine, in experiments to determine the usefulness of roof bolting as a method of roof support in a mine with varied ground conditions and to determine possible cost savings.

Although the tests at the Lark Mine are still going on, the results to date can be summarized as follows:

(1) Bolting is effective where anchorage can be obtained in a stratum that has not flexed to any extent.

(2) Placing of bolts before collaring openings has reduced overbreak and timber requirements.

(3) Fire hazards have been decreased.

(4) Roof bolts are successful in heavy ground in conjunction with timber.

(5) Use of roof bolts produce a reduction of maintenance costs.

(6) They have not proved effective in the stoping areas tested to date but will be tried in other stoping operations.

Final results of many of the experiments cannot yet be determined, but work so far has shown where roof bolting is effective. Under such conditions, the practice will be continued. Experiments have also shown where roof bolting is not effective. In some such conditions, it will be abandoned. In others, further tests will be made.

Combined Metals' Roof Bolting Experience

By E. S. McINTYRE
Assistant Superintendent
Combined Metals Reduction Co.

ROCK BOLTING experiments in four mines operated by the Combined Metals Reduction Co. in Nevada where badly fractured ground is common to many of the stoping areas have been in progress for the past eighteen months at the Pan American, Prince, Caselton, and No. 1 mines of the company. Results varied depending upon the type of ground where the bolts were installed.

Experience to date shows that roof bolting will not replace square set timbering in this badly fractured ground, but indicates that roof bolting will accomplish objectives wherever there is a relatively unfractured, uniform back over the ore bodies.

When properly applied under favorable conditions, roof bolting is a very useful tool. The advantages are obvious where they can be adapted for use, but roof bolts are by no means the answer to all timbering problems.

Inherent difficulties in using roof bolts in these mines are due to the badly fractured ground. A network of major faults divides the district into a multitude of fault blocks in which the elevation of the favorable limestone horizon may differ as much as 1000 ft between adjoining blocks. Each fault block contains a criss-cross of small faults and fractures with throws of a few inches to 25 or even 50 ft. The complex fault systems and the inevitable adjustments within the fault blocks, including minor thrusting and bedding plane movement, has thoroughly fractured the brittle limestone and weakened the more plastic shale.

GOLD AND MONETARY PROBLEMS

Session Chairman
DONALD H. McLAUGHLIN
Chairman, Gold Producers Committee
American Mining Congress

The Right of the American Gold Producers

By HON. PAT McCARRAN
U. S. Senator from Nevada

BEFORE 1933 a gold miner could sell his product for any price he could obtain anywhere in the world. Gold was recognized as a monetary metal and an industrial raw material; as a monetary metal it could be used as a personal store of value without any restrictions.

In 1933, new ideas, new concepts of economics were being tried in an attempt to solve the country's problem. As a result of these theories gold was nationalized. A price was fixed in 1934 and ever since the miners have had to deliver their gold to the Mint and accept payment in the same number of dollars for it. Average prices today are nearly double those of the 1935-39 period, but gold still brings the $35 price set in 1934. The gold producer became price control's first victim. In addition to this the Government has raised the miners' taxes and gives little allowance for depletion of his resources.

Fixing prices of commodities, which started during World War II and was recently revived, was established to control inflation. During the years since 1940 rising prices for gold in the world market have been a reflection of rising commodity prices not the cause of such a rise.

Monopoly in any form is repugnant to Americans. A monopolistic buyer of gold was tolerated in the 30's and the practice was continued from emergency to emergency down to the present day. For the second time in a decade, we are finding that a stockpile of gold is indispensable to the successful conduct of a war. In the past year our gold stock has declined $2,000,000,000, once again demonstrating that vitally needed materials and services are available if gold is offered in payment.

It has recently been suggested that an important method of reducing or adding to the volume of bank reserves in this country could be the open market purchase or sale of gold. This theory of credit control has promise of becoming a new weapon and should be fully explored by our central banking and treasury authorities.

Post-war revaluation of currency to bring about a realistic relation between money and gold constitute a world trend. Rather than fight a losing battle resisting it, the U. S. should recognize and conform to the trend.

The International Monetary Fund has failed to stabilize foreign exchange and currency relationship. Foreign

countries recognizing the increase in cost of production and demand for newly mined gold, have permitted more and more gold to be sold in the open market. This has reached such proportions as to establish a trend toward a more realistic appraisal of the price of gold as set by supply and demand. All experience since 1934 has gone to prove that while Congress can make many laws and repeal many laws it cannot repeal the natural laws of supply and demand. Recognition of this fact would eliminate premium gold markets and permit establishing an equilibrium price. Will the management of the Treasury have the integrity to recognize a changed situation which requires new policies, with the clear implication that the old policies were wrong or have been outgrown? It is time that we brought Treasury policies into line with world trends.

The time has come to make a basic choice. We can deflate our credit structure with unemployment and falling prices, or rid ourselves of the fallacy that the $35 per ounce price of gold is sacred. Let us abolish the monopoly on gold in the U. S. and let the forces of competition come in and establish in a true American way a representative price for industrial gold.

This country has grown since 1933. We have a greater productive capacity; we have better means of transportation; we have better means of communication, better schools, better hospitals, a better standard of living. It will require a lot of work and a lot of time and a lot of effort before we can say that we have a better dollar.

Does Our Gold Policy Make Any Sense?

By PHILIP CORTNEY

Economist and President

Coty International Corp.

MONEY should be a standard of value, a medium of exchange and also be able to serve as a store of wealth. This last requirement is not recognized by too many economists. Experience shows that the more the Government controls the printing-presses of money, the more people want gold as money. In the final analysis, international balances can be settled only with a merchandise acceptable to and desired by the creditor.

Now let us see what our gold policy is:

(1) We maintain an international gold bullion standard by buying and selling gold freely at a fixed price of $35 an ounce in transactions with foreign governments and central banks.

(2) Gold serves as the monetary reserve of the country as a backing for our money supply (currency and demand deposits in banks).

(3) Gold serves as a means of adjusting international balances.

(4) Gold should not be available for hoarding purposes.

The fact is that people are anxious to hoard gold only if they lose confidence in their national currency.

If gold is to serve chiefly as a medium for balancing international accounts, which means that it is used mainly for its merchandise value, why should our Government prevent our gold producers from selling their products at the best price they can get? Why should the people of the United States not be free to buy and hold gold?

In order to restore monetary order, our great objective must be to restore the gold standard internationally as soon as the world situation makes such restoration possible. This should be done with the greatest technical skill, to avoid a deflationary trend of prices similar to the one we had in the 20's after most countries had returned to the gold standard. A scheme to lead to the restoration of monetary order should include the following: (1) We should avoid further paper-money inflation and severely limit bank-credit expansion during the rearmament period. (2) As soon as world conditions permit, we should return to a gold standard, rearranged to limit the issue of currency and expansion of bank credit proportional to gold acquisitions by the Federal Reserve Banks. All our influence should be exercised on the main European countries to remove exchange-controls and resume the free convertibility of their currencies and at a later date to restore the stability of their exchanges. (3) With the stoppage of paper money inflation we should expect a down trend in prices. Not too long after the down trend has become obvious we should devalue our currency in terms of gold. This devaluation would be merely a sanction of the fall in the purchasing power of the dollar and should (a) increase the production of gold; (b) give the foreign countries perhaps in excess of $2 billion a year more to meet deficits in current international payments. (This is sounder than gifts.) (c) International gold liquidity, impaired by war inflation, would be restored. One way to economize gold is to restore free trade and to pursue with vigilance the objective of equilibrium in the balance of international payments. (4) Until world conditions permit the realization of the above, we should maintain our present gold bullion standard and permit the free purchase and sale of gold as well as the importation and exportation of gold. The U. S. Treasury should be permitted at its discretion to sell or buy gold at $35 per ounce in the free gold market.

The greatest service we can render the free world is to restore the soundness of our dollar. Barring war, the future of the free world is mainly in our hands. Freedom will be saved only if we show restraint and wisdom in our economic and monetary policies, and restore the gold standard as soon as world conditions will permit. The alternative is regimented and controlled economies all over the world.

New FluoSolids Experience

By G. C. COPELAND

The Dorr Co.

CURRENT critical shortage of elemental sulphur has led to new FluoSolids applications. The use of the process for producing sulphur dioxide is not confined to the high grade sulphur bearing ores. Ores containing as little as 20 percent sulphur have been roasted successfully with the production of strong sulphur dioxide gas.

Since FluoSolids reactors have no moving parts operators are not able to open the system during operations. Gas strength can only be altered by a change in fluidizing gas volume or oxygen content, by changing feed rates of sulphur content of the feed.

A significant improvement in the design of FluoSolid units has been development which allows free passage of the fluidizing gases and prevents solids sifting to the windbox even if gas flow is shut off entirely. This was first applied at the new Carlton Mill of the Golden Cycle Corp.

Waste heat boilers are being installed in conjunction with some units sold to sulphuric acid manufacturers. Heat recovery from the roasting of pyrites is economic with the larger roasters and is considered a necessary adjunct to the roasting of sulphides in Europe where fuel is scarce.

One new development has been the controlled sulphatizing of base metals. Close control over reaction temperature has opened up a wide new field in metallurgy. A technique has been developed to provide the means where it is possible to sulphatize or solubilize one of the base metals in the presence of, but to the exclusion of, another.

A unique application of sulphatizing on sulphur bearing concentrates comes from Australia, where one producer proposes to produce copper sulphate and zinc sulphate flotation reagents from their respective base metal concentrates. These concentrates are simply roasted, quenched in water, and the pulp or leach liquor used as a reagent.

FluoSolids processes have been developed and are in commercial operation for the heat treatment of mineral grains. Fuel economy is usually the most important consideration in applications of this sort and since the heated fluidizing gas passes directly through the grains treated, maximum utilization of calorific input is possible. Units of this type are suited to a variety of applications ranging from the removal of trace flotation reagents to heat treatment for improvement of physical character of certain abrasive grains.

Successful pilot plant tests have been completed in the field of beneficiating low grade iron ore. Here operations in a reducing atmosphere convert hematite to magnetite. Another application is the reburning of lime mud from water treatment plants.

An accepted tool for effectively carrying out gas-solids reactions in the chemical and metallurgical industries, many plants are being installed to relieve the sulphur shortage through the production of sulphur dioxide from metal sulphides for sulphuric acid and sulphite paper plants.

Among the important advances made in design over the past year is the perfection of a constriction plate capable of retaining the fluid bed while permitting ready passage of the fluidizing gas from the windbox into the fluidizing zone. Sulphatizing roasts of copper bearing concentrates have been perfected in both laboratory and pilot plant operations and will open up a new field in the hydrometallurgical treatment of copper ores.

Suspension Roasting of Sulphides

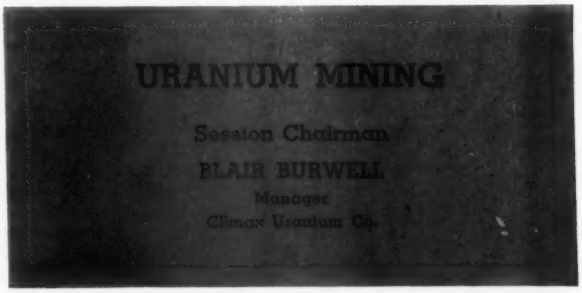
By K. D. McBEAN
Metallurgical Engineer
Consolidated Smelting & Refining Co., Ltd. of Canada

EXPERIMENTS in suspension roasting were begun at Trail prior to 1928 and by 1931 eight furnaces there had been modified to use the process in treating waste sulphur dioxide gases. In 1932, a plant was built in Pennsylvania, and soon afterwards other plants were installed in the United States, Japan, Norway, Poland, Northern Rhodesia, France, Spain, Australia, and the Argentine. Additional plants are now being designed in other foreign countries.

Although the Cominco installations throughout the world have been designed principally for zinc concentrates, several full-sized furnaces have been operating at Trail on iron sulphide concentrates containing about 36 percent sulphur, the speaker stated. Considerable suspension roasting also has been carried on in an experimental unit on pyritic concentrates, and on other materials.

It has been established experimentally that the process can be used successfully without the use of extraneous fuel for the roasting of other mineral sulphides such as lead concentrates, copper concentrates, copper mattes and antimony sulphides, with the production of gases rich in sulphur dioxide and the efficient recovery of waste heat from the gases.

Essentially, the process should be applicable to practically all roasting or calcining operation with the use of supplemental fuel where necessary, and should yield all the advantages obtainable from high capacity rates, low labor requirements and efficient steam recovery.



Uranium Production in the Colorado Plateau Area

By FRANK H. McPHERSON
Manager, Colorado Raw Materials Operations
U. S. Atomic Energy Commission

DOMESTIC uranium ore and concentrate production during the past year has exceeded any other like period. Since the establishment of the Colorado Raw Materials Office late in 1947, the domestic uranium program has expanded from where there were two to eight domestic processing plants producing uranium concentrates.

It is the policy of the AEC that ore production as well as the processing of ore be done by private industry. With the exception of the Commission-owned plant at Monticello, Utah, all processing plants were built and are being operated by private industry.

The Commission is continuing its research program for the treatment of complex ores.

Use of Geology in Guiding Exploration

By R. P. FISCHER
Project Chief
U. S. Geological Survey

RESULTS obtained from exploratory drilling by the U. S. Geological Survey guided by geology appear to be about twice as good as those obtained from drilling using little or no geologic guidance. The geologic character-

istics that are useful in recognizing ground favorable for carnotite ore on the Colorado Plateau and in guiding the exploration therefor, are bedding, thickness, color of the sandstone; abundance of altered mudstone and of carbonaceous material; and the orientation of fossil logs and ore rolls.

In order to use these geologic features effectively in testing broad areas not close to known deposits, the U. S. Geological Survey proceeds with exploratory drilling in the following three stages: (1) widely spaced holes are drilled to appraise the favorability of ground; (2) moderately spaced holes are drilled in favorable ground to find ore deposits; and (3) closely spaced holes are drilled to offset discovery holes and outline ore deposits.

Progress of Exploration in Colorado Plateau Area

By THOMAS W. OSTER
Chief, Grand Junction Exploration Branch, Division of Raw Materials
Atomic Energy Commission

IT IS recognized that private industry cannot be expected to carry out the extensive exploratory program essential to the continued expansion of the uranium procurement program. Continued Government activity in the field of exploration, coordinated with the exploration conducted by private mining companies, will discover sufficient uranium ore for uninterrupted operation of existing and planned mills for several years to come.

The most unique and successful new prospecting technique is the application of airborne radioactivity surveying. High-sensitivity Geiger counters and scintillation counters are flown in small, slow-flying aircraft at distances of 50 to 300 ft from the ore-bearing rims. Concentration of uranium of commercial grade can be detected from the air and accurately located on air photos for subsequent ground inspection. Several recent discoveries are attributed to this method of prospecting.

Gamma-ray logging of drill holes has been developed to a point where accurate geologic logs can be prepared from the radio-activity logs. Within a short time, it will be possible to make accurate ore grade determinations *in situ*. This development will make it possible to eliminate much of the core drilling and adopt dry-hole non-core drilling methods, which are much less expensive. Research is being conducted to determine the feasibility of the application of side hole sampling techniques.

New Developments in Exploratory Drilling For Uranium Ore

By R. G. SULLIVAN
Vice-President
Minerals Engineering Co.

EXPLORATORY drilling in the Colorado Plateau during this year will reach an estimated total of 2,600,000 ft. Contract diamond drill core work for the account of the United States Geological Survey and the United States Atomic Energy Commission will approximate 60 percent of this total. The other 40 percent will be dry-hole drilling supplementing the core drilling. The dry-hole category is used to block out shallow ore zones in greater detail.

Dry-hole drilling on the Colorado Plateau refers to percussive long-hole drilling using truck-mounted specially designed light hammers with specially designed tungsten carbide bits and coupled steel. Hole depths vary from 40-120 ft. Samples are taken with each change in formation or at predetermined intervals.

Samples taken at two to five-ft intervals are immediately tested with a Geiger Counter; if any count is registered, the sample is sacked and tested more accurately later.

Usual performance is 200 ft per eight-hour drill shift but footages over 500 ft have been recorded. Cost of contracts have varied between $0.62 and $1.25 per ft. Work now is progressing in the use of higher pressure blowing air and in the use of drill tubing. If satisfactory drill tubing is available, depths to 200 ft should be obtained easily.

Some variances from general procedure are being used in isolated instances in the Colorado Plateau. Dry-hole drilling in the Grants District of New Mexico is accomplished with 2½ and 3 in. bits because large samples are required.

Before 1948 most diamond drilling was contracted by private operators for shallow ground adjacent to mining areas. However, with the United States Atomic Energy Commission Program, exploratory drilling spread out from the known shallow areas and numerous 300-400-ft holes were drilled. Each year the average depth of holes increases as the over-all program increases in size and scope. Government has announced an annual goal of 1,200,000 to 1,600,000 ft per year.

Water hauling for long distances, over tortuous, steep roads, was solved by using larger trucks equipped with tanks of approximately 75 percent of the truck's rated capacity. Freezing of water in the tanks was eliminated by installing large heater tubes. Water storage of 600 gal on the drill units helps provide adequate surge capacity between truck visits.

Loss of circulation has always been a problem in drilling the uranium fields. In shallow holes drilling is usually continued without water return, all emphasis being placed on speed, and by-passing water from the bit. The usual procedure for holes 150-ft and deeper is to carry one or two sizes of casing and ream to the point of loss. Use of an underreamer is now being tried at two locations.

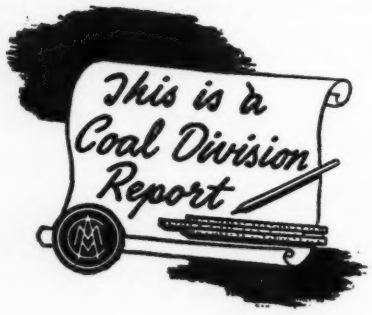
To speed up drilling in the plug bit section contractors first tried using tri-cone rock bits. This has been partially discarded because of high bit costs and excessive water consumption. Rock bits with air as the cutting medium have also been used, but wet sections held up progress and raised costs. Use of churn drills has also proved to be too expensive. Only two churn drills are being used in conjunction with diamond drill contracts.

It is hoped that the use of NX double-cone reamer in conjunction with an AX diamond pilot bit will help solve the drilling of both hard and loose unconsolidated ground.

Drilling cost has risen much faster than the increased depths would indicate. Two to three years ago contract prices for drilling shallow holes were $1.60 to $1.80 per ft. More recent contracts for deeper drilling have been $3.25 to $4.25 per foot. Experience to date with the deeper drilling indicates that present prices might easily be doubled, unless some new drilling practices are developed.

Advent of new equipment and methods in dry-hole drilling has tended to reduce over-all cost in areas formerly drilled by diamond drills. If the technological advances are used in conjunction with dry-hole drilling practices, the areas opened up for this cheaper method will become wider and over-all cost will be less.

Electric Power in Coal Mining



A Survey Shows Trends in Power Costs and Power Uses as Affected by Increased Mechanization

TRENDS in the use of coal mine power are clearly brought out in annual surveys made by the West Virginia Engineering Co., covering a large group of coal operations in West Virginia, Virginia and eastern Kentucky. The data present a very complete picture of how electricity is used and applied underground giving for each mine, the tonnage, substation capacity, demand and load factors, connected horsepower, purchased power and its cost per kw and per ton of coal. In addition, the figures show seam heights, gathering haulage methods, and tonnages hand loaded, mechanically loaded, and stripped.

These companies—their mining conditions and operating methods—can be considered typical of the country as a whole and their combined production of 38,000,000 tons per year gives authority to analyses based on this data. The seams are in what is termed the medium height class—a group average shows 51 in. of coal. The range, however, is from as low as 28 in. to as high as nine ft although only a very few of the mines are in or near these extreme limits. All types of modern equipment are used, mechanical loaders, continuous machines, belt conveyors, track haulage and mechanical cleaning plants. The extent of mechanization—76 percent of the total tonnage is loaded with mechanical loaders and 24 percent by hand loading—closely parallels the national average. As an item of interest, six mines with an annual production of over 1,000,000 tons use ac power for cutting machines at the face.

One exception to modern practice is that strip mining produces less than five percent of the total tonnage —considerably below the national average. This, however, is easily understood. The mountainous terrain does not lend itself to open pit operations and much of the stripping is in rather thin seams along steep hillside outcrops. The general conditions are not conducive to stripping; consequently, strip mining in this territory is only incidental and seems to be on the decrease. In 1949 there were 18 strip operations in the survey producing a total of about 2,225,000 tons; in 1950 this had been reduced to 12 operations which mined a total of 1,750,000 tons.

An Analysis of Trends

The foregoing gives a general and over-all idea of the operations covered in the survey. A detailed discussion of the power trends which the 1950 figures indicate, in comparison of those of previous years, is presented in the following analysis of trends by H. P. Musser, president, West Virginia Engineering Co., through whose courtesy the survey data is made available:

"The 1950 Analysis of Power Costs for Coal Mines compiled for the thirty-fifth consecutive year, covers a group of 171 mines in the Appalachian bituminous coal field with production ranging from 941 to 136,615 tons per month. This analysis with its breadth and continuity of data, and the yearly consistency and trends of the average figures, is authoritative for coal production in the Appalachian area.

"This analysis sheet again contains

Table I

POWER COSTS OF COAL MINES—AVERAGES FOR TEN YEARS 1941-1950

Year	Number of Mines	Average Monthly Tonnage	Substation Capacity kw	Average Monthly kwhr Purchased	Total Cost per kwhr (Cents)	Kwhr Per Ton Coal	Power Cost per Ton Coal (Cents)
MONTHLY TONNAGE CLASS—10,000 TO 20,000 TONS							
1941	50	14,955	309	79,331	1.56	5.30	8.30
1942	44	15,374	327	94,307	1.54	6.13	9.42
1943	48	15,067	334	88,799	1.57	5.89	9.23
1944	44	14,432	345	89,743	1.58	6.22	9.83
1945	43	14,443	370	85,923	1.68	5.97	9.49
1946	55	14,600	397	94,618	1.50	6.48	9.74
1947	48	14,568	393	99,781	1.53	6.85	10.49
1948	51	14,915	457	112,471	1.60	7.54	12.03
1949	79	12,900	596	123,649	1.70	8.76	14.90
1950	48	14,498	482	107,360	1.70	7.41	12.61
MONTHLY TONNAGE CLASS—20,000 TO 30,000 TONS							
1941	27	24,945	494	144,863	1.41	5.81	8.19
1942	35	23,915	448	132,718	1.48	5.55	8.22
1943	32	24,465	461	144,159	1.43	5.89	8.43
1944	35	24,578	467	146,831	1.46	5.97	8.64
1945	36	24,585	517	153,055	1.51	6.31	9.14
1946	34	24,838	603	164,187	1.44	6.61	9.51
1947	35	24,649	526	148,860	1.44	6.03	8.71
1948	29	25,035	634	171,094	1.53	6.83	10.44
1949	20	23,683	1,038	227,047	1.53	9.59	14.70
1950	37	24,246	794	199,411	1.60	8.22	12.82
MONTHLY TONNAGE CLASS—30,000 TO 60,000 TONS							
1941	27	42,130	736	232,853	1.34	5.53	7.38
1942	39	41,151	718	233,560	1.35	5.68	7.65
1943	30	38,373	685	226,363	1.40	5.90	8.23
1944	33	38,035	643	217,218	1.39	5.71	7.94
1945	26	38,774	796	255,587	1.42	6.57	9.34
1946	20	41,824	928	280,711	1.35	6.71	9.03
1947	34	40,129	840	273,174	1.37	6.80	9.35
1948	28	37,632	869	273,095	1.46	7.25	10.57
1949	18	40,442	1,527	367,142	1.44	9.08	13.10
1950	18	41,117	1,389	420,290	1.37	10.22	13.98
MONTHLY TONNAGE CLASS—OVER 60,000 TONS							
1941	11	86,017	1,412	592,332	1.11	6.89	7.65
1942	11	74,649	1,171	459,215	1.19	6.15	7.30
1943	14	80,440	1,250	485,859	1.21	6.04	7.30
1944	15	84,557	1,420	515,405	1.21	6.10	7.37
1945	15	80,935	1,593	543,479	1.22	6.87	8.25
1946	14	80,408	1,786	557,572	1.15	6.93	7.96
1947	17	99,971	1,856	644,103	1.17	6.44	7.52
1948	19	91,210	2,134	684,028	1.24	7.50	9.27
1949	10	77,616	2,417	697,278	1.21	8.98	10.85
1950	12	80,129	2,333	686,376	1.22	8.57	10.48

columns showing the percentage of coal mined by hand and mechanically. In 1948 there were 30 mines included in the analysis, producing coal entirely by hand. In 1949 the number decreased sharply to 15, but for 1950 the number rose again to 18. This is the first analysis sheet in many years to show an increase in number of 100 percent hand loading mines. This reversal is not necessarily indicative of a trend, but it might foretell a decreased rate of mechanization at the mines. The percentage of coal mined by stripping decreased in four of the classes, but increased in the smallest and largest classes.

"There were no prolonged industry-wide strikes during 1950 and this permitted the companies to make an improved operating record over strike laden 1949. The additional work days permitted many of the companies to increase their tonnage over 1949 and thereby move up to a higher tonnage class. Reversing a trend of the prior year, all classes of mines, except one, used less substation capacity to produce the output. Since there were fewer prolonged interruptions to work by strikes, many mines increased their tonnage output without enlarging their substation capacity. The substations were either loaded up, carrying higher demands, or operated usefully for a greater proportion of time.

"Load factor based on demand increased in four of the six classes indicating more continuous operation, or using the equipment during more hours of the working day. Small mines purchase power at load factors of about 25 percent, whereas, large mines maintain load factors nearly double this figure. One mine operating three shifts had a load factor of 62 percent. Load factor based on connected horsepower is higher for all classes except one, indicating that the equipment available was used for more hours in mining operations. This shows more efficient use of equipment and is definitely confirmed by the increase in tons produced per ac-hp in motors.

"The amount of electricity required to produce a ton of coal has not changed perceptibly in 1950. Three classes used less and three used slightly more kw-hr per ton. The least average amount used by a class was 7.41 kw-hr per ton and the highest was 10.22 kw-hr per ton. The cost per kw-hr has not changed greatly since the cost for three classes rose slightly, and for three classes fell slightly as compared to 1949.

"The net result of small changes in kw-hr per ton used and in the cost per kw-hr naturally is very little change in cost per ton. Again, three classes increased in cost per ton and three classes decreased. Groups of mines making small purchases of electricity paid an average of 17.79 cents per ton for power, while large mines as a class purchased electricity for just over half this amount, or 10.48 cents per ton.

"An indication of improved efficiency in the use of equipment is the decrease in ac connected load per kilowatt of demand in five of the six classes. Equipment is being loaded up and used to a greater extent. Machinery is not standing idle. This is further confirmed by the fact that more tons of coal were produced per hp of ac motors connected, in four out of the six classes. This shows more efficient operation, and the use of equipment over more hours of the working day."

Table II
TONNAGE MINED BY MECHANICAL AND HAND LOADING
In Mines Producing More Than 10,000 Tons Per Month

Year	Mechanical Loading	Hand Loading	Total Tonnage	Percentage of Total Mechanical Loading	Percentage of Total Hand Loading
1945	22,700,000	21,100,000	43,800,000	52%	48%
1946	25,900,000	17,400,000	43,300,000	60%	40%
1947	34,800,000	20,700,000	55,500,000	63%	37%
1948	32,800,000	18,500,000	51,300,000	64%	36%
1949	25,600,000	10,300,000	35,900,000	71%	29%
1950	25,719,960	8,897,904	34,617,864	74%	26%

Table III
METHODS OF LOADING IN VARIOUS SEAM HEIGHTS

No. Mines	Average Seam Height	Average Monthly Tonnage	Percent Hand Loading	Percent Mechanical Loading
21	41"	3,000	43%	57%
35	42"	7,500	30%	70%
48	43"	14,500	31%	69%
37	48"	24,000	20%	80%
18	52"	41,000	38%	62%
12	54"	80,000	16%	84%

Table IV
RELATION BETWEEN MECHANIZATION AND POWER COST

Average Monthly Tonnage	Percentage Mechanical Loading	Kwhr Per Ton	Power Cost Per Ton
3,000	57%	8.1	17.8¢
7,500	70%	8.4	15.1¢
14,500	69%	7.4	12.6¢
24,000	80%	8.2	12.8¢
41,000	62%	10.2	14.0¢
80,000	84%	8.6	10.5¢

Statistical Summary

The complete survey covers 171 mines, giving 23 items for each one, which makes a total of more than 4000 figures. As space will not permit a reproduction of the survey sheet in its entirety,* some extracts may serve as a substitute. Table 1 compiled for this purpose gives averages for the past 10 years for tonnages, power purchased and power costs. It includes only the mines whose production was more than 10,000 tons per month, as this group—115 in number—produced more than 90 percent of the entire survey tonnage.

Table 2 indicates the steady growth of mechanical loading in the past six years. This is brought out by the percentage figures rather than the tonnages, as the total field production each year is governed by coal consumption and not by mining methods. In this group, considering the loading methods, the mines fall into three categories. Of the 115 operations, 56 are completely mechanized, 52 have both mechanical and hand loading, while seven are on hand loading entirely. This classification assumes that mines which load as much as 90 percent of their output with machines are completely mechanized, as the small amount of hand loading done in such operations is incidental and usually confined to isolated entries or clean-up sections. Table 3 shows the effect of seam height on total production and percentage of mechanization. As would be expected, the higher seams produce the greatest tonnage and are also more completely mechanized. Table 4 is presented merely as a matter of interest to show the relation between the power cost per ton and the percentage of mechanical loading in the various tonnage classes.

* Copies will be furnished on request.

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All avenues of thought were carefully explored by the 35-man committee

Program Committee Convenes

Plans Laid for Cincinnati Meeting—May 5-7

ON Wednesday, November 14, the Allegheny Room of Pittsburgh's William Penn Hotel was the gathering place for the National Program Committee for the 1952 Coal Convention of the American Mining Congress. Kenneth A. Spencer, president, Pittsburg & Midway Coal Mining Co. and Chairman of the Committee, presided at the morning and afternoon sessions where plans for the meeting were discussed and the framework constructed for an excellent three-day program. From every part of the country representatives, of those who mine the coal and of manufacturers who keep them furnished with the latest and best in equipment and supplies, were present to see that all phases of underground and surface mining, of coal preparation and safety were carefully considered.

In selecting topics for the program the 35 committee members reflected the industry's determination to keep in close touch with all the new things developing, either in actual operations or on an experimental basis. All developments which have for their objectives improvement of the operating efficiency of men and the productive performance of equipment were reviewed. But the committee did not lose sight of the fact that by far the greater part of present coal tonnage is being produced with conventional equipment. Speakers will be chosen to describe improvements and performances of these essential methods and practices.

In the realm of research the industry will be brought up to date on coal gasification experiments, on production of liquid fuels from coal and pipeline transportation, as well as other projects leading to greater production and more efficient utilization.

In short, plans were formulated for a Convention which promises to be one of the best of these AMC meetings to date. The work of the committee does not end with the shaping of plans. Its members have accepted the responsibility of seeing that the seeds sown in Pittsburgh on November 14 bear meaty fruit in Cincinnati's Netherland Plaza Hotel on May 5-7, 1952. Plan to be there for the harvest!

Those who expect to attend this meeting are urged to make reservations directly with any of Cincinnati's hotels, and to do so as soon as possible.

Program

MONDAY MORNING
General Session: Utilization—Materials Controls

NOON: Luncheon Meeting

TUESDAY MORNING
Session A: New Developments
Session B: Mine Haulage
Session C: Management

NOON: Luncheon Meeting

WEDNESDAY MORNING
Session A: Maintenance and Power
Session B: Safety

MONDAY AFTERNOON
Session A: Roof Support
Session B: Strip Mining

TUESDAY AFTERNOON
Session A: Continuous Mining
Session B: Strip Mining

WEDNESDAY AFTERNOON
General Session: Preparation

EVENING: "Speechless" Banquet

Wheels of GOVERNMENT

AMC

As Viewed by A. W. DICKINSON of the American Mining Congress

UP from the balmy breezes of Key West has come the recent disclosure that the Administration will again call upon Congress for more tax increases in 1952. This disturbing announcement is made despite the known attitude of Finance Committee Chairman George and Ways and Means Committee Chairman Doughton, both of whom have stated that only through canvassing methods of raising new taxes can additional money be brought into the coffers of the Treasury.

Authorized spending commitments made by the 82nd Congress total $89.6 billion in fiscal year 1952. Senator Byrd of Virginia, a most ardent advocate of economy in Government, estimates that Federal spending will exceed income by at least $18 billion in fiscal 1953, "despite $15 billion in new taxes piled upon us in three tax bills enacted during one year."

The Ways and Means Committee report on the Revenue Bill of 1951 states that confiscation of all normal and surtax net income over $10,000 would yield only an additional $3.5 billion in taxes from individuals; and it should be remembered that enactment of the bill reduced this figure to $3 billion.

This is startling—we are at the bottom of the barrel.

Renegotiation

The new Contract Renegotiation Board has set up its offices and is engaged in organizing a staff. Regulations under which the Act will be administered are now in process.

Named as secretary of the Board is Nathan Bass, who served with the War Price Adjustment Board in World War II. Special assistant to Board Chairman John T. Koehler is Edward Dawson of the Navy Department; James McEnrue of General Services Administration is administrative services officer; Melvin Reese of the Civil Defense Agency is director of the Office of Management; Hal Stone of the Civil Defense Agency is personnel director; and John Ganey of the Department of the Air Force is budget director.

As stated in previous issues, the Contract Renegotiation Act of 1951 contains the exemption which removes from renegotiation "any contract or subcontract for the product of a mine, oil or gas well, or other mineral or natural deposit, or timber, which has not been processed, refined or treated beyond the first form or state suitable for industrial use."

Freight Rates

Although the Interstate Commerce Commission has not scheduled open hearings on the request of the railroads to permit the full 15 percent freight rate increase requested last March, four Federal agencies have registered their opposition to the petition. The Department of Commerce, Office of Price Stabilization, General Services Administration, and the Tennessee Valley Authority have made objection to the ICC on the grounds that the railroads have operated but a short time under the August increases of 9 percent in eastern territory and 6 percent in the rest of the country and are thus not in a position to accurately appraise the result.

While it is reported that major shippers have decided not to oppose the railroads' petition at this time, it is known that demands are in the making that the ICC enforce the present provisions of the law requiring it to consider the effect of freight rates on the movement of traffic; that rates be just, reasonable, and non-discriminatory as measured by the cost and value of economical service, and returns to the carriers must be predicated upon proof of efficiency and economy of operation. There is a growing public insistence that the ICC, the Department of Commerce, and other Government agencies responsible for transportation, including the military, carry on a continuous program of investigation and recommendations as to the measures which will give the country the most economical and efficient transportation. There is a call for a positive, constructive program, not mere opposition to the proposals being pressed by the railroads or other carriers.

Government Power Plants

Director Wilson of ODM has expressed qualified approval of the bill reported at the end of the last session by the House Public Works Committee, which would authorize construction and operation in the Pacific Northwest of eight fuel-fired electric generating plants totaling 400,000 kilowatts capacity. The power would be marketed by the Bonneville Power Administration.

Wilson favors a system of power in the Pacific Northwest incorporating sufficient steam generating capacity to correct the imbalance between interruptible and firm power which now exists because of the reliance of hydropower. He does state that, "In view of the critical shortage of many of the materials involved, I do not believe we should commit materials at this time for construction of power plants if they are to be used only for standby purposes. Rather, they should be regarded as a regular working part of the power grid in the area. The latest

(*Continued on page* 90)

★ ★ ★ ★ ★ ★ ★ Washington Highlights

Congress: Reconvenes January 8.

AMORTIZATION: Pre-certification postponed.

RENEGOTIATION: New Board functions.

FREIGHT: Federal agencies protest rate hike.

GOVERNMENT POWER: Fuel-fired plants an issue.

SYNTHETIC FUEL: Plants studied.

PUBLIC LANDS: New Minerals Division.

★ ★ ★ ★ ★ ★ ★

With the Defense Agencies

by HARRY L. MOFFETT

APPRAISING the progress of the defense mobilization program recently, ODM Director Charles E. Wilson declared that he believed military production goals can be met without interrupting, except for "minor changes," the present levels of civilian goods output.

Wilson said that a series of strikes had retarded the defense program and called upon U. S. workers to hold strikes to a minimum. As to metals, he pointed out that the primary requirements of the military for strategic metals such as steel, aluminum and copper have been met on schedule but that there has not been enough to meet all secondary needs.

Industry to Feel CMP Pinch in First Quarter

While Wilson was indicating that the nation could continue to maintain present production levels for both guns and butter, DPA Administrator Manly Fleischmann made public first quarter 1952 allotments of controlled materials which revealed that production of civilian durable goods will be slashed to at least 50 percent of pre-Korean levels. He forecast that civilian production in the early part of 1952 would be "moderately lower" than in the last quarter of 1951.

This outlook was further bulwarked by DPA's issuance of a revised list of "Basic Materials and Alternates," which included nearly 400 materials, a large portion of which are in short supply. "Most critical" items on this list included aluminum, lead, tin, zinc, copper, platinum, cobalt, columbium, molybdenum, nickel and tungsten. Listed as insufficient for defense and essential demands were beryllium, germanium, calcium, copper chemicals, selenium and styrene.

Further indications that the materials pinch will be felt in the months ahead are apparent from the inventory restrictions placed by NPA over a wide range of chemicals and minerals. "Practicable minimum working inventory" restrictions have been slapped on users of asbestos, beryllium, cerium, industrial diamonds, carbon electrodes, fluorspar acid, iridium, mica, osmium, selenium and tantalum.

OPS Issues New Price Regulations

After months of delay, the Office of Price Stabilization finally got around to applying the Capehart Amendment to the Defense Production Act to its pricing regulations.

On November 9, OPS ordered the General Manufacturers' and Machinery Price Regulations (CPR's 22 and 30) to become effective December 19, and supplemented these regulations with provisions for optional adjustment of ceiling prices under terms of the Capehart amendment. The latter supplements allow cost increases to be figured from the end of the permitted base period quarter selected by the manufacturer and to take into account both direct and indirect costs not considered "unreasonable or excessive."

OPS has also: (1) increased the price ceilings of products in which lead and zinc are important raw materials to reflect the 2 cents a pound increase made in the price ceilings of these metals; (2) established specific dollars and cents ceilings on antimony metal, ranging from 49½ cents to 50½ cents a pound f.o.b. shipping point depending on grade; (3) set a ceiling price of 48 cents a pound for antimony oxide and 43 cents a pound for sodium antimonate; (4) authorized producers of brown iron ore in Southeastern States to raise their prices by 2 cents a long dry unit above the prices permitted under GCPR; and (5) sanctioned boosts of 40 cents per net ton in coal briquets and 50 cents per net ton on packaged fuel produced in the Great Lakes area.

No Immediate Scheduling Order for Mining Machinery

The Mining Machinery Industry Advisory Committee met with NPA officials on November 15, and following extended discussion it was determined that a proposed scheduling order to control the production and distribution of mining machinery would be shelved for the time being.

The Industry Committee said the order is not needed, declaring that the present method of controlling the distribution of mining machinery through rated orders is working reasonably well.

NPA urged mining machinery manufacturers not to demand priority ratings on orders for machinery placed with them. If the manufacturers' order boards are filled 100 percent with rated orders, some additional controls will be necessary to make certain that the essential mineral expansion programs and direct military purchases are kept on schedule, NPA said.

NPA officials emphasized that the percentage of rated orders on a manufactuerer's books will not affect the allocations of materials made by NPA to the manufacturer.

The committee promised it would immediately advise individual companies to instruct their sales departments to stop asking for priority ratings on orders if such ratings are not actually needed to assure delivery on time. The committee also recommended that all mining machinery manufacturers be notified that material allocations by NPA are not based upon the number of priority orders which a manufacturer accumulates.

(*Continued on page* 97)

AMC Personals

President Truman has appointed **John J. Forbes** director of the Bureau of Mines, Department of the Interior.

He replaces James Boyd, who retired from that position last month to go with Kennecott Copper Corp. Forbes is a native of Shamokin, Pa., in the heart of the anthracite-producing region of Pennsylvania. He has been chief of the Bureau's Health and Safety Division since 1948, having previously served as chief engineer of the Safety Extension Service, chief inspector of the Coal Mine Inspection Division, and chief engineer of the Mineral Production Security Division.

Paul D. Ritter of the Red Jacket Coal Corp. was elected president of the Coal Operators Association of Williamson Field at the annual meeting of that organization held recently at Williamson, W. Va. **J. M. Tulley**, president of the Crystal Block Coal and Coke Co., was elected vice-president; **J. D. McLaughlin**, treasurer; and **Joseph J. Ardigo**, secretary.

Alfred H. Drewes has been elected a vice-president of National Lead Co. Drewes became a member of the board of directors and the executive committee in October, 1950. He has been assistant to the president of the company since 1947 and is a director of Baker Castor Oil Co. and of Titanium Metals Corp. of America.

Joseph J. Morsman, Jr., was named treasurer of the company, succeeding **Charles Simon**, whose retirement was announced at the same time. Simon will continue as a company director.

U. B. Buskirk recently resigned as president of the Kearns Coal Co. because of ill health. He will remain with the company, however, as a vice-president. He was succeeded by **Robert H. McCormick**, formerly vice-president, who will continue as sales manager. **Irvin H. Hildebrandt** was elected as first vice-president. He will continue as secretary and treasurer. **Ralph A. Gerding** was elected assistant secretary.

All officers of International Minerals & Chemical Corp. were reelected at a recent meeting of the board of directors of the corporation, according to Louis Ware, president.

Officers are **Louis Ware**, president; **James P. Margeson, Jr.**, executive vice-president; **Robert P. Resch**, vice-president and treasurer, Financial Division; **Franklin Farley**, vice-president, Phosphate Division; **A. Norman Into**, vice-president, Potash Division; **J. R. T. Bishop**, vice-president, Amino Products Division; Dr. **Paul D. V. Manning**, vice-president, Research Division; **Edward D. McDougal, Jr.**, general counsel and secretary; **Edward Tubbs**, comptroller; and **Thomas M. Ware**, chief engineer.

E. B. Leisenring has resigned as chairman of the board of directors of the Stonega Coke and Coal Co. He has been chairman of the board for 22 years and will continue to serve as director and as chairman of the executive committee. Leisenring also resigned as president of the Westmoreland Coal Co., Westmoreland Inc., and the Virginia Coal and Iron Co. **Ralph Knode**, formerly president of Stonega and senior vice-president of the other companies, has succeeded Leisenring in all positions. **E. P. Humphrey** was elected president and a director of Stonega and a director of Westmoreland Coal, Westmoreland Inc., and V. C. & I. Co.

Louis Buchman, general manager of western mining divisions for Kennecott Copper Corp., has announced the appointment of **S. R. Zimmerley** as director of research for the western mining divisions. Zimmerley was chief of the metallurgical branch, Region IV, U. S. Bureau of Mines.

Stanley B. Johnson, president of The Lorain Coal and Dock Co. and The Lorado Coal Mining Co., announces the promotion of **Frank A. Burke** to director of sales and **Robert L. Crow** to sales manager. Burke was formerly sales manager and Crow assistant sales manager.

L. J. Randall has been elected president of the Hecla Mining Co. and **R. W. Neyman** appointed general manager. Both appointments were effective December 1, the day on which the resignation of A. W. Witherspoon, former president and general manager, went into effect.

L. J. Randall

Randall's election came three years after he joined the company as secretary-treasurer and comptroller. He was graduated from University of Idaho in 1933 with a degree in business administration. The years between have been filled with experience in banking, mining and as a partner in the accounting firm of Randall and Magnusson. He is a member of the American Institute of Accountants and a member of the American Mining Congress Tax Committee.

Neyman, a native Kansan, moved to Idaho in 1906. He joined Hecla Mining Co. in 1930, and through application of his knowledge of structural, mechanical and mining engineering was responsible for many improvements in methods and equipment in their mines. Some of the mining equipment which he invented is in nationwide use.

Election of **Franklin E. Turton** as vice president of Braden Copper Co., a subsidiary of Kennecott Copper Corp., has been announced by Charles R. Cox, president of the parent company.

Turton has been associated with Braden Copper Co. in Chile for 38 years, having started his career there as a young mining engineer. For the past seven years he has served as general manager, the chief executive of Braden in Chile. He has been a director of the company since 1946.

Charles Dorrance has become associated with the firm of Stevenson, Jordan and Harrison, Inc., as senior mining consultant. He retired in April, 1951, under the Corporation Retirement Plan of West Virginia Coal and Coke Corp., Inc., as president of that company.

A. H. Featherstone, president of Golconda Lead Mines, Inc., has announced the election of **Harry F. Mag-**

nuson as secretary-treasurer and director of the company. He succeeds **W. H. North**, who recently resigned.

M. D. Harbaugh, former vice president of the Lake Superior Iron Ore Association, has been named president of that organization. Harbaugh, who continues as secretary, succeeds **Donald B. Gillis**, mining consultant and retired vice-president of the Republic Steel Corp., who resigned. Other officers of the association are: **Gillies Elton Hoyt, II, E. B. Greene** and **H. L. Pierce.**

M. H. Detweiler has retired as vice-president of the Zeigler Coal and Coke Co. after 28 years of service with the company.

Detweiler first became identified with the coal industry in 1909, when he joined the Madison Coal Corp. He returned to school later and was graduated from the Missouri School of Mines in 1911. After working with a Utah mining company as engineer and mine manager, Detweiler joined Zeigler Coal and Coke in 1923.

A number of personnel changes have been made in the American Smelting and Refining Co. **L. H. Hart**, assistant general manager, Western Mining Department, has been transferred to New York as resident engineer; **Keith Whiting**, formerly chief geologist of Northwest Division of the Western Mining Department at Wallace, Ida., has been transferred to Salt Lake City as exploration engineer; and **Norman Visnes** has been named mine superintendent of the company's deep development project at the Vulcan silver-lead property, Wallace, Ida.

Regents Scholarships at New Mexico Institute of Mining and Technology have been presented to **Jerry Tannich** of Deming and **Scott G. Baum** of Monument, N. M., it has been announced by William G. Camp, director of the College Division.

Dr. Walther Mathesius, president of Geneva Steel Co. who has announced his retirement from that position effective December 1, will become a consultant for the Freyn Engineering Department of Koppers Co., Inc.

Born in Germany in 1886, Dr. Mathesius was graduated from the Institute of Technology in Berlin. In 1911, he came to America and joined the American Steel and Wire Co. in its physical and research laboratory. In 1912 he was transferred to Chicago where he became general superintendent of the South Works of the Carnegie Illinois Steel Corp. In 1935 he was made manager of operations for the Chicago district of Carnegie Illinois, and in 1937 became vice president in charge of operations for the U. S. Steel Corp. of Delaware.

The Harlan County Coal Operators Association held its 35th annual meeting on November 14. **J. S. Greene**, president of Garmeada Coal Co., was elected president of the organization, succeeding **R. C. Scott**, who was appointed a member of the board of directors. The newly elected vice-president is **M. M. Ellison**, president of the Southern Kentucky Coal Co. **George S. Ward** was reelected secretary.

R. H. Whitney, general manager of Minnesota mines for The M. A. Hanna Co., has announced the appointment of **Earl Farnam** as assistant superintendent of the Perry and Mississippi group of mines, and **John Bemis** assistant superintendent of the Carly and Section 18 mines.

Appointment of **Frank W. Chambers** to the executive staff of Kennecott Copper Corp. as director of engineering has been announced by Charles R. Cox, president of Kennecott.

Associated with the Koppers Co. for many years, Chambers served on the Steel Plant Expansion Committee of OPM prior to United States entry into World War II. He was project manager of the Butadiene-Styrene plant built in 1943 at Kobuta, Pa., for the production of synthetic rubber stock. Thereafter he served 2½ years in the U. S. Navy.

After returning to civilian life, Mr. Chambers spent 18 months in Chile, supervising the organization and construction of the first integrated steel plant on the west coast of South America. Since January, 1949, he has been production manager of the Engineering and Construction Division of Koppers Co., responsible for all engineering and construction performed by that company.

Present officers of the Southern Appalachian Coal Operators' Association have been reelected for 1952. They are: **C. R. Griffith**, president; **S. G. Moore**, first vice-president; **D. E. Griffith**, second vice-president; and **C. W. Davis**, secretary.

Robert Henderson and **Charles A. Cleeves** have joined the Mining Division of E. J. Longyear Co., according to R. L. Loofbourow, manager of the Mine Contracting Department.

Appointments of an assistant division chief, three branch chiefs and an assistant branch chief of the Minerals Division in the Washington, D. C., headquarters of the Bureau of Mines was announced recently.

Charles W. Merrill, chief of the Base Metals Branch, was named assistant chief of the Minerals Division, of which **Lowell B. Moon** is the chief. Succeeding him as chief of the Base Metals Branch is **Charles H. Johnson.**

Waldemar F. Dietrich, heretofore chief of the Rare and Precious Metals Branch, was named chief of the Ceramics and Fertilizer Materials Branch, while **Richard H. Mote** succeeds him as chief of the Rare and Precious Metals Branch.

—Obituaries—

Herbert E. Bell, founder of Bell and Zoller Coal and Mining Co., died November 22 in Pasadena, Calif. Eighty-four years of age, Mr. Bell entered the bituminous coal industry 64 years ago and is regarded as one of its real pioneers. For many years he served as president and chairman of the board of Bell and Zoller and of related coal companies in Illinois. Also founder of the Cardox Corp. in 1931, he served as chairman of the board of this company until his retirement early in 1950.

The death of **Raymond Charles Force**, first president of Caterpillar Tractor Co. and a member of its board of directors, occurred November 15 in Oakland, Calif.

Herbert A. Nelson, 51, of Eastern Gas and Fuel Associates, died recently in Pittsburgh.

Mr. Nelson was lake forwarding agent in the office of H. W. Crawford, Cleveland district manager.

He joined Eastern Gas and Fuel in April, 1950, after having been associated with H. M. Norris in Cleveland since 1923. Mr. Norris conducted his own lake forwarding business and had represented Eastern Gas and Fuel from 1928 until he closed his business in 1950.

HOW OUR BABY HAS GROWN!

It was only a few years ago that we looked for the first time at our new No. 5 Steel Tie and said proudly, "Here's a husky youngster that's going to make its mark in the world."

Saleswise, of course, it was the baby of the Bethlehem tie family. But what a baby! Weighed five pounds per foot and was far sturdier than many people thought necessary. But Bethlehem felt that increased sturdiness was soon going to be needed in mine track. Mechanized equipment was steadily growing heavier. Loads were getting bigger. Everything pointed to the need for a rugged steel tie that could be taken up and reused many, many times. The No. 5 was it.

And now—1951—the No. 5 is Bethlehem's largest seller. How that baby has grown!

It's a better tie than ever, today. You can depend upon it to carry those big motors, cutters, and loaders without buckling or sagging. Broad, deep, thick, it effectively resists vertical pressure . . . and a special channel construction gives added support where it is needed most.

It's so easy to install, too. Simply fit the stationary clip against the rail base; tap the revolving clips into place. Repeat at the other end. There's your tie . . . in and ready for work.

We'd like to tell you more about the No. 5. It makes good listening. Why not ask a Bethlehem man to show you what it will do for your track?

BETHLEHEM STEEL

BETHLEHEM NO. 5 STEEL TIE

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NEWS and VIEWS

Eastern States

Approve Diesel Shuttle Car

After exhaustive tests, the Bureau of Mines has approved the first diesel-electric shuttle car for operation in non-coal mines. It has a three-cylinder diesel engine which drives a generator which, in turn, provides the power for two traction motors to drive the car and one motor to operate the conveyor.

Cooling of the exhaust gases to a safe point is accomplished by a scrubber. No provision is necessary to eliminate carbon monoxide from the exhaust because the small amount liberated by an approved diesel-powered machine can be diluted safely by adequate ventilation, according to Bureau engineers.

Engineer Extracts Titanium

Arthur J. Kerbecek, a young Ph.D. candidate at the Columbia University School of Engineering, has developed what may prove to be the answer to one of America's urgent defense problems in metallurgy—the problem of extracting titanium economically in large quantities.

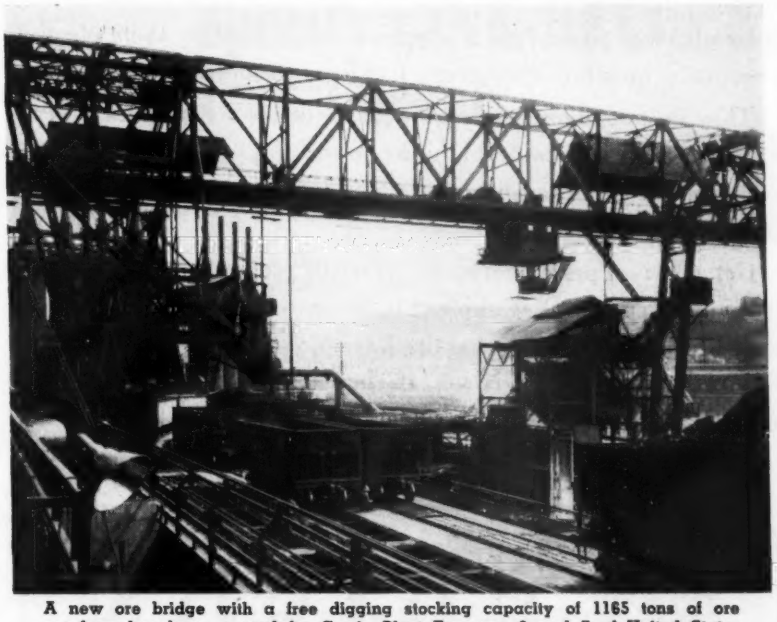
Although details of the process have not been revealed, Kerbecek said that an electrolytic method is used to reduce the chloride, prepared from the original oxide. He said that his process also can be used for the reduction of zirconium, large quantities of which are sought by the Atomic Energy Commission.

Zirconium, for which, like titanium, there is at present no wholly satisfactory commercial extraction process, might prove cheaper than molybdenum, chromium, and tantalum in alloys. Zirconium, too, is corrosion-resistant.

Start New Steel Mill

Fabrikant Steel Products, Inc., began construction of a new million-dollar steel mill in Albany's old lumber district at formal ground-breaking ceremonies recently. This was announced by Commissioner Harold Keller of the New York State Department of Commerce and Bernard Fabrikant, New York City, president of the steel company.

Construction of the new Fabrikant steel mill will be the first major new plant development in the steel industry in eastern New York State in over 30 years. A force of nearly 200 workers will be employed at the new mill when it gets into full operation. Work on necessary plant foundations will begin



A new ore bridge with a free digging stocking capacity of 1165 tons of ore per hour has been erected for Carrie Blast Furnaces 6 and 7 of United States Steel Co.'s Homestead District Works, near Pittsburgh. The structure, with a 186-foot span, has a bucket capacity of 15 tons and was designed to supplant two 7½ ton ore bridges. Dravo Corp., Pittsburgh, fabricated the entire structure, except the main span which was built by American Bridge Co.

at once. Construction of the mill is scheduled to begin early in 1952 when delivery of structural steel is anticipated. Also scheduled for early construction by the Niagara Mohawk Power Corp. will be a new high-tension electric line to provide the huge amounts of power required for the plant's operation.

Reopen Alabama Mine

An iron ore mine about four miles northwest of Gaylesville, Ala., has been reopened and is currently producing about 60 tons of ore a day. The Pilgrim mine, idle since the recent death of J. A. Pilgrim, is now being operated by Hubert Pilgrim and T. J. Espy under the corporate name of P. & E. Mining Co. The mine is shipping its output to Republic Steel Corp. at Gadsden.

N & W Improves Export Dock

Coal dumpings at the Norfolk and Western's Lamberts Point piers near Norfolk, Va., will be greatly expedited by a new classification yard to be built immediately by the railway.

The 30 tracks in the new yard will have a total length of 9.7 miles and include a complete car-retarder system. Officials say that the improved facilities for switching coal to be delivered to vessels will not only relieve congestion and reduce delays in dumping, but will result in quicker release of cars for return to the mines. The work is scheduled for completion by next January 15.

Phosphate Property Sold

The board of directors of International Minerals & Chemical Corp. has authorized a contract with shareholders of Hoover and Mason Phosphate Co. providing for the acquisition by International Hoover and Mason's outstanding capital stock, according to a statement Louis Ware, president of International made at the annual stockholders meeting in New York recently.

The acquisition will be made through an exchange of International's common shares for those of Hoover and Mason Phosphate Co.

Under the transaction International Minerals will acquire between $750,000 and $800,000 in cash or current assets and about 2,500 acres of phosphate mining property, principally in the Rutherford Creek area in Maury County, Tenn., which Mr. Ware said would "add substantially to International Minerals & Chemical Corporation's undeveloped phosphate reserves." The transaction will involve the exchange of approximately 40,000 shares of International's common stock.

Offer Aid to Students

Several scholarships have been made available to worthwhile students working for their B.S., M.S., or E.M. degrees in the School of Mines, Columbia University.

These scholarships, known as the Henry Krumb scholarships, provide the recipients with $1,000 a year plus traveling expenses to New York (within the United States). They are granted on the basis of ability and not necessarily that of need, and are an effort to attract the sons of mining men to the profession.

Application blanks and further information can be obtained from the Office of University Admissions, Columbia University, New York 25.

Making their annual inspection trip, directors and top officials of the Baltimore and Ohio Railroad recently toured the bituminous coal-producing areas along the B & O lines in central West Virginia

Gorgas Project Completed

Four years of extensive experiments conducted by the Bureau of Mines at Gorgas, Ala., have shown that gases suitable for driving gas turbines and generating steam can be obtained through underground gasification—the burning of unmined coal in place. Further tests may prove the feasibility of producing gases for conversion to synthetic liquid fuels or chemicals, according to a report of the Department of the Interior.

The successful experiments, staged jointly by the U. S. Bureau of Mines and the Alabama Power Co., were pioneered between January 21 and March 12, 1947, when it was proved that coal in place could be burned, and that the burning could be controlled.

During the 22 months continuous operation of the second project a total of 10,485 tons of coal, underlying an area of almost two acres, was gasified. Over a four-month period when 65 percent of the heating value of the coal consumed in one area was realized, the energy yield was greater than could have been obtained from the coal mineable from the same area under existing mining methods.

Further experiments are to be staged at Gorgas, the report revealed. A new installation is being constructed which features a series of electrodes for passing electrical current through the coal seam to open passages for air and gases. The new electrical system reduces site development costs and virtually eliminates all underground labor.

Wheels of Government

(*Continued from page* 81)

information supplied me indicates that the proposed Northwest steam plants would be used in this latter way."

The steam plant proposals were sparked by the cutting off of power from aluminum pot-lines early this Fall. For an aluminum plant now under way in Texas, power will be furnished by a lignite-fired plant and similar practice is under discussion in other parts of the country.

The U. S. Bureau of Mines is now preparing to operate the experimental alumina plant at Laramie, Wyo., for recovering alumina and cement raw material from anorthosite rock and other low-grade aluminous ores. An appropriation of $350,000 is available to complete construction of the plant and an additional $1 million has been requested in the 1953 budget for operation. General Services Administration has issued a permit transferring custody of this plant to the Department of Interior for two years.

Synthetic Fuel

Interior Secretary Chapman's request for a Congressional authorization to lend $455 million for commercial installation of a coal hydrogenation plant and an oil shale plant has brought forth sharp protests from the petroleum industry. Chapman has stated that it is his duty "to advance the (commercial) development of liquid fuels from shale and by synthesis from coal, by any and all feasible, reasonable, sensible means, consistent with national laws, national interests, and national policy."

Meanwhile the Secretary has authorized an engineering audit and an evaluation of the U. S. Bureau of Mines report on cost estimates for coal hydrogenation. This work will be based on a hypothetical 30,000-barrel-per-day plant at Rock Springs, Wyo., and a hypothetical 30,000-barrel-per-day in Union County, Ky. Ultimate objective of the study is the determination of the average required wholesale selling price of the gasoline and liquefied petroleum gas produced by coal hydrogenation plants over the life of the project, based on costs of January 1, 1951, and current selling prices of the by-product.

The president of the American Petroleum Institute has recently declared that, "Industry studies indicate that the synthetic program, as compared to the exploration, producing and refining of petroleum, is not as yet economically attractive; and, further, that this is no time for the unwarranted use of capital, labor and ma-

terials for a project of this sort. Synthetic fuel development carried on by Government directly or through subsidies, becomes a competitive element that could have a substantial and serious effect on the future exploration of our natural resources.

Public Lands Administration

Establishment of a new "Division of Minerals" within the Bureau of Land Management is characterized by Interior Secretary Chapman as "the means the Department is taking to facilitate the development and leasing of minerals on the public domain."

Head of the new division is Lewis Hoffman, who has been chief of the old Minerals Division of the Bureau of Land Management since July, 1943.

For a number of years there has been sharp criticism of the lack of enforcement of the mining laws by the Bureau of Land Management, and of the Bureau's repeated assertions that violations emphasize a need for amendment of the laws to take control of the surface away from a mining claimholder and even to substitute a leasing system for the present right of location and patent.

These efforts on the part of the Bureau of Land Management were brought before the recent convention of the American Mining Congress in Los Angeles by A. O. Bartell, a mining engineer of Portland, Ore. Bartell declared that a detailed study of the mining laws in relation to the development of natural resources in Oregon shows conclusively that the laws themselves do not impede full utilization of resources other than mineral. He said the real danger lies in the fact that the Bureau of Land Management, instead of vigorously enforcing the mining laws in order to correct the condition, is widely publicizing abuse cases and throwing the blame on the "archaic mining laws dating back to 1872."

Bartell charges that the aim of the Bureau of Land Management is to gain complete control of the surface of all public lands under its jurisdiction, and that in Oregon the Bureau has found a relatively receptive atmosphere in which to promote the clamor for changes in the basic mining laws. He called upon the Bureau to stop the abuses of which they complain by immediately and consistently enforcing the provisions of the mining laws.

A. S. & R. Co. to Have New Lab

Ground has been broken in South Plainfield, N. J. for a new building to house the central research laboratory of the American Smelting and Refining Co. The new building will provide 82,000 sq ft of floor space, almost twice the space now occupied by the laboratory at the company's Perth Amboy Plant, and will be completed and occupied within one year.

Teach Engineers Safety

No engineering education is complete without a study of safety engineering, H. W. Heinrich, assistant superintendent of the Engineering and Loss Control Division, Travelers Insurance Co., Hartford, Conn., declared at the 72nd annual meeting of the American Society of Mechanical Engineers held in Atlantic City, N. J. He advocated the integration of safety engineering with existing studies and described a method which can be carried out without additional time for either instructor or student in an already full schedule.

After consultation with 32 deans, professors and instructors, the A. S. M. E. Safety Committee drew up material suitable for one-term class instruction.

While he emphasized the necessity for integration so that all engineering students could acquire an awareness of accident occurrence and prevention sufficient to discharge their normal obligations as practicing engineers, Heinrich expressed the conviction that the importance of safety engineering deserves a distinctive college degree.

Coal Exports Climb

Overseas exports of U. S. coal, principally to Europe, exceeded 24,000,000 net tons for the first nine months this year, and are continuing to climb. In September, overseas coal loadings passed the 4,000,000-ton mark. A recent survey points to a prospective 1951 total of 36,000,000 net tons exported to destinations overseas. Last year, exports of U. S. coal amounted to less than 3,000,000 tons. The enormous difference bespeaks the coal deficiencies in the Atlantic Pact countries, which the United States is being called upon to make up.

It is now certain that 1951 coal exports to Europe and other overseas destinations will be the biggest in history, save only in the post-war peak year of 1947, when almost 47,000,000 tons were shipped. Europe is taking between 85 and 90 percent of this coal, with the remainder going to Central and South America and relatively small amounts to Africa and the Far East.

Eagle-Picher Reorganizes

The Eagle-Picher Co. has simplified its corporate structure by absorbing The Eagle-Picher Mining & Smelting Co., Orange Screen Co. and The Eagle-Picher Co. of Texas which have been operated as wholly owned subsidiaries. This reorganization was entirely internal in character and in no way affected either customer relations or stockholder interests. It was merely a move to streamline The Eagle-Picher Co.'s organization and operations.

Elmer Isern, president of The Eagle-Picher Mining and Smelting Co., and K. E. Kimmel, assistant secretary, have been elected vice president and assistant secretary, respectively, of The Eagle-Picher Co. Miles M. Zoller, manager of the Pigment Division of The Eagle-Picher Co., has also been elected a vice-president of that company.

Cleveland-Cliffs to Expand

The Cleveland-Cliffs Iron Co. has announced a $45,000,000 capital expenditure program to develop additional iron mining properties and expand its ore-carrying capacity.

About $28,000,000 will be spent for mining properties to produce more ore and replace properties being exhausted.

Enlargement and improvement of the company's lake fleet, including construction of a new ore carrier, conversion of a Victory ship to an ore carrier, and repowering of certain other carriers, will require $13,500,000.

Explore Asbestos Mine

A $5000 contract to explore for reserves of asbestos—a strategic and critical mineral with important insulating uses—in Marinette County, Wis., has been entered into between the Government and industry.

Under terms of the Defense Minerals Administration contract, the Government will contribute 90 percent or $4500 to the cost of the project, and the Star Mining Co. of Madison, Wis., the operator, the remaining amount.

Stripping of the overburden by a bulldozer around a small outcrop containing chrysotile is now in progress on the Herriman farm about seven miles west of Nathan, Mich.

The exploration contract will be completed within 90 days from the time of its recent signing. If the deposit proves to be economic and is mined within 10 years, the operator must repay the Government loan through the percentage of royalty realized from mining the area defined in the contract.

Expand Aluminum Plant

The Kaiser Aluminum & Chemical Co., Chalmette, La., has entered into an agreement with the Government to extend its facilities to produce an additional 100,000 tons of aluminum for stockpiling and other defense needs. General Services Administration has signed a contract with the Kaiser Co. which provides for doubling the capacity of the plant, located near New Orleans. An agreement was reached a year ago with the company to produce an initial 100,000 tons of aluminum.

Metallurgists in Demand

Metallurgists from 37 nations attended the recent World Metallurgical Congress in Detroit, Mich. Sponsored by the American Society for Metals, the meeting was the first international conclave concerned with a world science of metals.

According to Frank X. Higgens, project administrator for the Economic Cooperation Administration, this was "the largest ECA technical assistance program ever staged, and successfully brought about an information exchange between management and labor."

There was evidence of one metal problem: the shortage of metal scientists and engineers. One company posted an employment sign in the Statler Hotel lobby, "Metallurgist Wanted." Young metal scientists in attendance at the functions commented upon "numerous offers," and another spokesman said there was a marked rise in the number of advertisements for metallurgists in the nation's press during the Detroit meeting.

Illinois Miners Meet

On November 2 the Illinois Mining Institute held its annual meeting in Springfield, Ill. Highlighting the one-day meeting were addresses by Charles W. Connor, Defense Solid Fuels Administrator, and Dr. William M. McGovern, Northwestern University. Mr. Connor spoke of the future of coal and the coal-fired gas turbine for producing electricity in the dry areas of the West. Dr. McGovern addressed those attending the annual banquet, using as his topic "The Road Ahead."

The meeting was well attended, with 834 persons registering. The newly elected president of the organization is Clayton G. Ball, vice-president of Paul Weir Co. William Bolt, superintendent, Freeman Coal Mining Co., is the new vice-president. B. E. Schonthal will continue as secretary-treasurer.

Open Ferro-Chrome Plant

Stockholders of Chromium Mining and Smelting Corp., Ltd., were told that a $1,000,000 two-furnace ferro-chrome plant is expected to be in operation near Memphis, Tenn., soon. Leo Timmins, company president, made this statement at the recent annual meeting.

The plant will be operated by Montana Ferroalloys, Inc., a wholly-owned subsidiary of Chromium Mining and Smelting Corp. (NY) a subsidiary of the Canadian property.

Develop Michigan Iron Ore

The Cleveland-Cliffs Iron Co. of Cleveland, Ohio, and The Ford Motor Co. soon will begin mining operations to produce 400,000 tons of concentrates a year from the Marquette Range at Humboldt, Mich., on a property which has lain dormant to commercial mining since 1920.

The crude ore, called jasper on the Marquette Range, will be mined from an open pit and passed through concentrating units to produce a product substantially higher in iron content than the ores now being commercially mined in the Lake Superior region.

First of the concentrating units will be capable of producing 200,000 tons annually. Development of the property will begin immediately, and capacity production is expected by late in 1953. A second uit of similar capacity is scheduled to be in operation by 1955.

A new company, to be owned jointly by Cleveland-Cliffs and Ford, will be formed to undertake the development and operation of the property, which will be known as the Humboldt Mine. Production from this property will be a part of the 2,000,000 tons of ore which Ford uses annually.

In 1949 diamond drilling at the Humboldt property financed by Cleveland-Cliffs and Ford established that a sufficient tonnage of crude material existed to warrant development. A research laboratory was completed by Cleveland-Cliffs at Ishpeming, Mich., that year to develop economic methods for processing the lean ores owned by Cleveland-Cliffs in the Lake Superior district. Work done here established a process for the concentrating of the lean ores at the Humboldt property. On the basis of field samples Cleveland-Cliffs acquired a large acreage by ownership or lease.

Name Michigan Mine

Pickands, Mather & Co. has just announced that the extensive new operation on the Gogebic Range of the Puritan Mining Co., owned jointly by The Youngstown Sheet & Tube Co. and the Bethlehem Steel Co., will be named the "Peterson Mine" in honor of Arthur F. Peterson, vice-president, Mining Division, Bethlehem Steel Co.

The group of properties now to be known as the "Peterson Mine" consists of what were formerly known as the Puritan, Ironton, Yale and Colby Mines. These were formerly operated to a depth of 2000 ft for various periods dating back to 1885, and all were considered exhausted to the depths reached. No one of these properties could justify a deep mining operation and only by grouping several could a mine be created. In 1942 Puritan Mining Co. undertook a deep exploration program and recently the sinking of a new shaft from surface to a depth of 3900 ft has been undertaken. It is expected that when development is completed the Peterson Mine will rank among the larger underground operations in Michigan.

Start Cannon Shaft

Excavation has begun for the new Cannon Shaft of the M. A. Hanna Co. Named in honor of G. M. Cannon, former assistant general manager, the shaft will be one of the largest in Iron County, Minn., measuring 15½ by 21 ft, and is expected to reach a depth of 1600 ft.

A contracting company will sink the shaft to the ore body. From here the Hanna Iron Ore Co. will take over and finish the shaft. A new hoist house and shop will be built nearby.

U. S. Buys Aluminum Output

A recently signed contract provides that the Government will have first call for five years on the aluminum output of the new smelting plant being built by Aluminum Co. of America at Rockdale, Tex. When month-to-month Government requirements take less than two-thirds of the metal produced there, the remaining aluminum up to the two-thirds total will be made available to other users of aluminum in the form of pig or ingot during the five-year period.

At the conclusion of the five-year term, such pig and ingot customers will continue to have first call on 25 percent of Alcoa's Rockdale production for an additional 15 years. The remaining aluminum produced by the new expanded facilities will be made available to the market in the form of semi-fabricated and fabricated products.

Similar agreements were recently reached by Alcoa and General Services Administration concerning the aluminum output of the company's new smelting facilities now being built at Wenatchee, Wash., and of two additional smelting lines currently being built to augment Alcoa's existing works at Point Comfort, Tex.

Form Coal Co. Subsidiary

Announcement has been made of the newly formed subsidiary (Paradise Collieries, Inc.) of West Virginia Coal and Coke Corp. Executive and administrative operations will be controlled and directed by the parent organization.

Development of the Paradise Collieries' property, located on Green River in Muhlenberg County, Ky., is now being carried on. Coal from the property will be shipped by barge on the Green River and by rail on the Louisville and Nashville Railroad.

Officials of the new organization are: T. G. Gerow, president; T. R. Workman, vice-president; and A. H. Crane, secretary-treasurer. The local engineering office of the corporation is at present located in Greenville, Ky.

Western States

Anaconda Enters New Field

Cornelius Kelley, chairman of Anaconda Copper Mining Co., has announced that the company is entering the aluminum production field. It is understood that Anaconda will acquire commitments from the Harvey Machine Co. to build a primary aluminum plant at Kalispell, Mont.

Initial plant capacity is estimated at 54,000 tons per day but may be stepped up. Anaconda will obtain its bauxite from other companies now in the aluminum field and will not build an alumina plant as Harvey expected to do. The new plant will be about 250 miles northwest of Butte, Mont., and will be financed without government aid.

Brucite Mill Completed

Installation of a heavy media separation plant to handle brucite ore has been completed by Basic Refractories of Cleveland, at its Gabbs Valley property south of Luning, Nev. The company owns huge deposits containing the nation's only known commercial grade brucite, used chiefly for firebrick, furnace linings and similar refractories.

A new flotation plant is being considered to process magnesite ore from two new mines recently opened by the company. Some magnesite is shipped to the company's Maple Grove, Ohio, plant, but most of the product is purchased by eastern and western steel producers.

Water from the Empire Zinc Co.'s flooded Robert Emmet shaft spurts through a drill hole into the Leadville drainage tunnel, which is being driven by the U. S. Bureau of Mines to unwater this famous Colorado lead-zinc district and restore it to production. Harry Greshuk, project manager for the contractor, looks on.

Develop Oro Flame Mine

With some 100,000 tons of gold ore proven, early production is expected at the Oro Flame mine, six miles south of Prescott, Ariz. The first unit of a mill will be erected as soon as machinery can be obtained. Development has been pushed energetically since the old property, covering seven patented and eight unpatented claims, was taken over by the newly organized Oro Flame Mining Co.

Reactivate Quicksilver Mine

Engineers are preparing to reactivate a quicksilver mine on the slopes of Mount Diablo near Clayton, Calif. An organization known as the Mt. Diablo Quicksilver Co., Ltd., has leased the property from the Bradley Co. of San Francisco.

Kaiser Sells Coal Mines

Independent Coal and Coke Co., Salt Lake City, has acquired the Castle Gate and Clear Creek coal mines in Carbon County, Utah, from the Utal Fuel Division of Kaiser Steel Corp. Kaiser previously had obtained the properties from Utah Fuel Co.

North Butte To Expand

In a move to increase copper production, the Defense Minerals Procurement Agency has advanced $60,000 to the North Butte Mining Co. of Butte, Mont., to expand its facilities at the Granite Mountain mine on Butte Hill. The company's plant there will be enlarged to produce about 7,000,000 lb of cement copper. The company will repay the loan by delivering the copper at a fixed price to the Government. The North Butte firm has been carrying on a copper leaching program at its property for over a year.

Acquire New Holdings

R. N. Cooper, president of the Miners Gold Mining Co., has announced that his firm has acquired several new holdings. They include claims Nos. one through five, uranium prospects near Marysvale, Utah; two cinnabar prospects at Dutch Flats, Nev.; and 25 manganese claims, 10 miles south of Greenriver, Emery County, Utah, including five in the Black Bird group, 15 in the Big Blanket group and five in the Victory group.

Mollie Kathleen Ships Gold

A shipment of 37 tons of ore from the Ferguson and Kumetat lease on the 10th level of the Mollie Kathleen mine at Cripple Creek, Colo., has been treated at the Carlton mill, according to Lee Brown, mine superintendent.

Brown reports that the Brown and Denman lease on the 11th level of the Mollie Kathleen will be started soon.

Identify Robinsonite

According to information received from the Bureau of Mines, a new mineral was found by Edgar H. Bailey of the Geological Survey in 1943, while investigating quicksilver deposits at the Red Bird mine in Pershing County, Nev. Although suspected to be zinkenite or jamesonite, the mineral could not be immediately identified. When tests failed to reveal its identity, X-ray pictures were taken at Queen's University, where the mineral displayed the typical pattern of boulangerite and lead-antimony sulfide, which had been produced synthetically by Dr. Robinson of that institution.

Dr. Robinson's exhaustive investigations of lead-antimony sulfide ultimately provided the key to identification, and in tribute to his invaluable contribution to the work, the new mineral was named "robinsonite."

With the Defense Agencies

(*Continued from page* 83)

Solid Fuels MRO Order Issued

NPA has issued a new order, M-87, which became effective October 24, under which solid fuels producers are permitted to use the allotment symbol H-8 to obtain limited quantities of controlled materials and the ratings DO-H-8 to obtain non-controlled materials for maintenance, repair, and operating supplies (MRO) and for minor capital additions.

A producer using the procedure set forth in the Order M-87 must establish a quarterly quota based, in general, on the rate of his expenditures for MRO in a base period consisting of the last nine months (April through December) of the calendar year 1950. In calculating the MRO quota base, a producer multiples by twelve the monthly average of all MRO expenditures in the standard base period consisting of the last nine months of 1950. Under the order, the standard quarterly quota is 30 percent of the quota base. A seasonal quota for all four quarters is 120 percent of the producer's quota base and may be divided among the four quarters in accordance with the seasonal requirements of the producer.

The order affects coal mines, coal preparation and processing plants, merchant and integrated coke plants, and coal chemical and petroleum coke calcining facilities.

Producers who have filed Form DSFA-1 with the DSFA in accordance with SFO-1 may apply to the DSFA for priorities assistance to obtain machinery, equipment, or materials for major capital additions.

Under the terms of Order M-87 a producer may not order or receive more than 40 percent of his quarterly quota of MRO items during the first month of any quarter. A similar provision is contained in Amendment 1 to CMP Regulation No. 5.

The allotment symbol and rating may not be applied by the producer to obtain in any quarter materials for minor capital additions exceeding 10 percent of his quarterly MRO quota or $2,000, whichever is greater. The order is being administered by the Defense Solid Fuels Administration.

DMPA Holds Advisory Committee Meetings

During the past month officials of DMPA have met with Industry Advisory Committees representing the zinc and antimony industries.

At the zinc meeting industry officials were advised of projected requirements through the currently scheduled mobilization program, and

were invited to offer suggestions for expanding present mining facilities and opening of new deposits, foreign as well as domestic.

DMPA is now in the process of formulating a zinc program, based upon its own studies and the opinions given it by industry.

At the antimony meeting problems of maintaining production at levels high enough to meet rising defense and civilian needs were discussed. The industry was advised of projected requirements of antimony for the mobilization program and invited to suggest plans to maintain a high level of production.

The meeting was also devoted to extensive discussion of price structure and manpower problems presently confronting the antimony industry.

Meanwhile, it has been announced that DMA has signed 178 exploration contracts since April calling for a total expenditure of $9,424,870.62 by industry and Government. The contracts cover exploration for a wide range of metals and minerals.

Metal Mining Faces Manpower Shortage

A Bureau of Labor Statistics report declares that the metal mining industry faces a shortage of workers "at a time when it must expand its work force."

The report declared that under present mobilization plans, an estimated 120,500 workers will be needed in the metal mining industry by 1955. It said that employment in the industry averaged 104,800 in the first six months of 1951, with 83 percent of the workers employed in iron ore, copper, lead and zinc mining, 10 percent in gold and silver, and the remaining 7 percent in mining other metals.

New Economic Stabilizer Named

Eric Johnston, economic stabilization director, left that post on November 30 to return to industry. President Truman has named Roger Putnam, Massachusetts business man to succeed him. Putnam, a former Mayor of Springfield, Mass., has announced that he has agreed to hold the ESA post for six months "if they'll let me stay that long."

Ship Montana Phosphorous

The first elemental phosphorous ever produced in Montana left the Silver Bow plant of the Victor Chemical Works early in November. The first tank car was shipped to the firm's Chicago Heights, Ill., plant. Output of the new plant augments the production of Victor's other electric furnace plants in Tennessee and Florida.

The Silver Bow plant manufactures phosphorous from phosphate rock mined at Victor's Maiden Rock mine, near Melrose, Mont. Presently, sufficient phosphate ore has been stockpiled at the plant to operate the furnace for several months. Mining operations at Maiden Rock have been under way for over a year, and the company is currently developing additional phosphate properties in the same area.

Power for the Silver Bow plant is supplied by the Montana Power Co. and the Bonneville Power Administration. The plant consumes an amount of power equal to that normally used in a city the size of Denver. The availability of greater supplies of power is expected to coincide with the completion of a second furnace.

In addition to the electric furnace, the plant is equipped with large storage silos, machine shop, office and laboratory quarters, change rooms, and steam generating plant. The superintendent of Montana operations is C. G. Derick. William Anderson is superintendent of mining operations.

Spokane-Idaho Leases Mine

Spokane-Idaho Mining Co., operating the old Constitution zinc-lead mine on upper Pine Creek, near Mullan, Idaho, has leased the adjoining Douglas mine for a period of 10 years. The Douglas was one of the first producers on Pine Creek and paid the first dividend from that area.

Rebuild War Eagle Mill

Reconstruction of the War Eagle mill at Manhattan, Nev. has been resumed by Mark Bradshaw, Nevada mine operator. Cyanide and flotation units which will treat gold ore from a number of small mines in the Manhattan district and adjacent areas are now being installed. Built many years ago, the War Eagle mill recovered gold valued at more than $3,000,000 from Manhattan deposits.

Blackstone Producing Gold

Operated under lease by Sanchez Brothers, the Blackstone gold mine, four miles west of West Point, Calif., is again producing gold ore. The vein is mined through three tunnels and about 15 tons of ore are milled daily. Small amounts of lead and silver are also recovered.

Located on the East Belt, a few miles from the Mother Lode, the Blackstone was worked in the early days of the West Point district and produced much high-grade ore. The vein lies between granite walls and has been developed to about 250 ft. The East Belt is noted for small, rich ledges.

Lease Premier Mine

Ore development has begun at the Premier copper mine near Carson City, Nev., leased recently by Canadian-American Tungsten Co. Reconditioning of the mill is planned soon, with some units scheduled to process tungsten ore.

Tip Top Road Ready

Blue Ridge Midway Gold Mines, Inc., has announced that its new road to the Tip Top tungsten mine has been completed and the road to the more recently acquired Hilton Creek property has been improved. The company now anticipates shipping 75 tons of ore daily over these roads. Both properties are in the Bishop, Calif. area at 10,000-ft elevation. All necessary machinery has been installed in the mines and more than 100 tons of ore have been produced. Ore will be hauled to the U. S. Vanadium Corp. plant for treatment.

Calumet-Hecla Plans Project

Development of extensive mineral acreage in the Tonopah mining district is scheduled by Calumet & Hecla Consolidated Copper Co., as soon as financial arrangements can be made and equipment secured. M. A. Diskin, Nevada representative of the corporation, reported another major mining company will be associated with Calumet & Hecla in development of the property controlled by Tonopah Development Co., north of Tonopah, Nev.

Present plans include rehabilitation of the 900-ft King of Tonopah shaft, sunk many years ago, and preliminary exploration of territory already tested by diamond drilling.

Admiral Mine Changes Hands

The Admiral Consolidated Mining Co. has taken over operation of the Admiral Consolidated mine at Leadpoint, Wash., from John Colby. Colby released the firm from an operating agreement signed early this year. He had rehabilitated mine machinery and produced 100 tons of zinc concentrates before a leg injury forced him to forego active mine operation.

Make First Ore Shipment

The Butte, Mont., mine of the Mitchell Mining Co., Mt. Vernon, Wash., has recently made its first shipment of ore. Regular shipments from the mine, now in the hands of a group of Washington men, are expected to be made in the future. Assays showed the presence of silver, manganese and gold in the first ore. Two shifts of workers a day are being maintained.

Huntley Leases Mill

Tungstar-Hanging Valley Mining Co. has leased its mill at Bishop, Calif., to Wright H. Huntley, president of Huntley Industrial Minerals, Inc. The mill was built in 1941 by Western-Knapp Engineering Co., and is located in Pine Creek Canyon. Huntley has reconditioned the mill for straight gravity process operations. He plans to run 200 tons a day of old tailings and about 100 tons of tungsten ore from mines in Tungsten City.

New Use for Gilsonite

Research by the American Gilsonite Co. in the use of gilsonite, a hydrocarbon produced in Utah, indicates the hard, brittle, black mineral can be used as an insulating material. The results of the research show that gilsonite ranks with crushed cork in "thermal non-conductivity." Management of the company believes that application of gilsonite as an insulator may call for vastly expanded production of the mineral at the company's mine near Bonanza, Utah.

Development at Idaho-Maryland

Veins containing free gold and shoots of specimen ore have been established by development work in the virgin zone between the 2300-ft level of the Idaho mine and the 3280-ft workings of the Brunswick property of Idaho-Maryland Mines Corp. at Grass Valley, Calif. Six ledges, extensions of veins developed in the Brunswick, were discovered in the Idaho last May, and have been explored and developed through a crosscut from the bottom of the Brunswick shaft and a deep winze sunk from the 2700-ft Idaho level.

The ore zone extends to the 2300-ft level of the Idaho and geological conditions are encouraging for persistence of veins to further depth. Albert Crase, president and general manager of Idaho-Maryland Mines, recently said that the new orebodies assure 15 to 20 years of productive operations. Mining is progressing in an area interlaced with producing veins, and there is a large area available for future development.

Investigate Longshot

The Pioneer Mining Co., owner of the Longshot mine in Stevens County, Wash., has taken over a prospect discovered by two men cutting brush for the Government on a forest fire area. The new owners located 19 mining claims surrounding the original discovery and started bulldozing the surface. This work had uncovered a mineral vein 35 ft wide for 150 ft in length, when the overburden became too deep for the machine. Hand sorting methods have produced 23 tons of high-grade silver, lead, zinc, gold ore which was shipped to the Train smelter. The entire surface capping is now being shipped to a milling plant at Bossburg, Wash., for treatment. Bulldozing is estimated to have exposed 10,000 tons of commercial grade ore. The company plans a small 150-ton milling plant to aid in further prospecting the deposit.

Probe Sulphur Deposit

A crew of five men has been investigating deposits near Thermopolis, Wyo., where sulphur was mined during World War I. The project is being undertaken jointly by the U. S. Bureau of Mines and Kenneth Porter of Thermopolis. Porter, who was affiliated with the Sunlight sulphur project at Cody, Wyo., says efforts will be made to determine the extent and quality of the Thermopolis deposits before commercial mining is renewed.

Vanadium Corp. Buys Mill

Vanadium Corp. of America has leased from Hetzer Mines, Inc., the latter's tungsten mill located at Nederland, Colo., it was announced recently by William C. Keeley, Vanadium's president. Vanadium Corp. will immediately enlarge the capacity of the mill in order to process tungsten ores in that district. A purchase schedule has been set up whereby Vanadium Corp. will purchase ore from local sources.

Begin Vein Development

After completing a major-sized deep haulage tunnel over a mile in length, Nabob Mining Co. in the Pine Creek area of Idaho, is now starting a vein development program, partially financed by a Government loan. One part of this program will be driving a crosscut north from the west drift to open the Nabob vein where it has been tapped with a diamond drill. Another project will be the opening of the Nabob vein in the east drift on the east side of the McDougal fault and driving a raise to the upper workings where leasers are mining ore treated in the Nabob mill. A third phase is the driving of a crosscut south to open the Little Pittsburgh vein in Nabob ground. Leasers have been producing large tonnages of ore from this vein in upper workings for many years.

Increase Mine Facilities

The Mohawk Mine, owned by the Sunny Peak Mining Co. of Spokane, Wash., and located near Conconully, Wash., is now producing silver from an ore which also yields gold, lead, copper and zinc. Recent plant additions at the project include construction of a dry room and a compressor house, the addition of a diesel-driven air compressor, and the building of a 750-ft track tram over the road to the No. 2 tunnel.

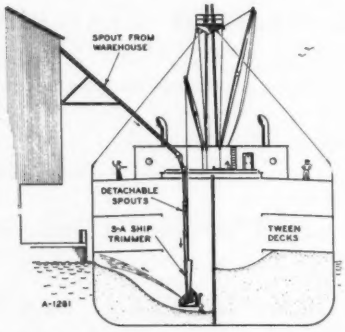
Ship From Crane-Hess Mine

Tungsten Associates of Beverly Hills, Calif., is developing the Crane-Hess mine in the Saddlebag Lakes area of Mono County, Calif., and has begun shipping scheelite ore. The company plans the construction of a mill and concentrator as soon as possible. They have done considerable development on the property, located at an elevation of about 10,000 ft, and a series of parallel veins has been disclosed. The lode has been exposed for a length of approximately five miles.

Manufacturers Forum

Loading Problems Eased

S-A ship trimmers are in operation at ports all over the world. Grain, chemicals, sugar and bauxite are just a few of the materials being loaded uniformly and rapidly into the holds of ocean-going vessels. Loading time



has been cut in half and manual attention reduced to only a fifth of the amount demanded by other loading methods. Capacities range up to 1500 tons per hour, depending on the type of material handled and the size of the trimmer belt.

For more details and photographs of actual installations of the S-A ship trimmer, write for Bulletin 951. Stephens-Adamson Manufacturing Co., Aurora, Ill.; Los Angeles, Calif., or Belleville, Ontario.

Splice Conveyor Belt

A new method of splicing steel cable conveyor belting, developed and patented by The B. F. Goodrich Co., Akron, Ohio, places all cables under equal tension during vulcanization so that each cable carries its share of the load in the finished splice.

The new method also permits the straightest possible splice, resulting in belts that track straight and true for economical, trouble-free operation. Laboratory stress-strain tests prove that the splice is as strong as anywhere else in the belt.

To make the splice, cable ends are cut in staggered pattern. Small tubular connectors are placed over the butted ends. Connectors are first given a light crimping. The partially made splice is then stressed to even the lengths of the cables, and connectors are given a final crimping to lock them to the cables. Rubber and fabric removed for the splice is then rebuilt around the cables. The splice is cured under tension with a conventional vulcanizer.

The tensioned splice can be made in the field as well as at the factory. Only special tools needed are a crimping device for squeezing the connectors to anchor the cable ends, and a special scraping tool to remove rubber from the cables.

Dozer A Ripper

Preco back-rippers, which mount on the back of bulldozer moldboards and rip only when the tractor backs up, are now available for angling blade bulldozers, according to an announcement by Preco Inc., Los Angeles, manufacturers of the equipment.

The four back-ripper housings are welded to the under side of the "C" frame on angling blade bulldozers, permitting their use irrespective of the angle of the blade itself. The teeth float on top of the ground when the tractor moves forward, and automatically dig and rip when the tractor

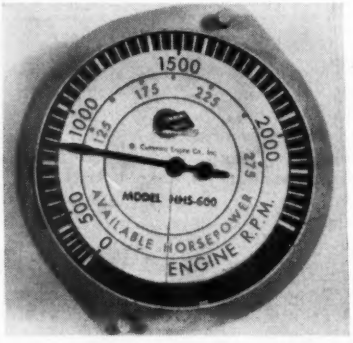
backs up. Thus the deadhead back-up time becomes a profitable operation and enables the blade to make a full load on each forward trip. When desired, the teeth can be locked up out of the way. Rocks, roots, shale and other material impossible to blade out easily can be ripped out with a single back-up pass with Preco back-rippers.

Complete information on rippers for angling blade bulldozers as well as for straight blade equipment can be secured by writing Preco Inc., 6300 East Slauson Avenue, Los Angeles 22, Calif.

Driver Aid

As a reminder to truck drivers that maximum horsepower is available only at the governed speed of the engine, Cummins Engine Co., Inc., Columbus, Ind., has designed and copyrighted special tachometer dial faces.

Company officials point out that the new face design will show the driver the approximate available horsepower



as well as engine rpm at all times. Old design tachometer dial faces only showed an engine's rpm.

Cummins Service Department technicians believe this new tachometer dial face will help the driver and prevent engine lugging.

New special tachometer dial faces for six different models—all for Stewart-Warner tachometers, are now available for Cummins Diesels. Owners can obtain these new tachometer dial faces by contacting any Cummins dealer or by writing the company at Columbus, Ind., and indicating the model number of the tachometer installed on the equipment.

Classifier Allows Sharp Cuts

A new classifier with operating characteristics of both the conventional cyclone and centrifuge is now in production by Equipment Engineers, San Francisco, Calif. Called the Centriclone Classifier, it combines the independent variation of residence time and velocity attributed to a centrifuge with the tremendous shearing force of a cyclone.

This combination, according to the manufacturer, gives a new character

of sizing by allowing sharper cuts to be made than previously were considered possible in mineral dressing. Overflow particles can be held below five microns in size. Underflow solids can be thickened with 98 percent weight recovery.

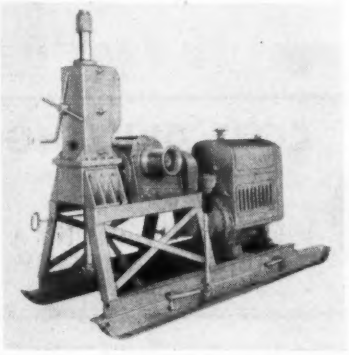
Among primary applications for the Centriclone are sharp classification of very thick pulps in the 65- to 200-mesh range and micron-sizing of normal slurries. The Centriclone is manufactured in 10-, 20- and 30-in. sizes with capacities of 30-100, 150-600 and 250-800 gpm respectively.

Further information and a free bulletin describing this product may be obtained by writing Equipment Engineers, 41 Sutter Street, San Francisco 4, Calif.

Introduce Shot Core Drill

The new Acker shot core drill designated as the Model KR is designed to recover cores from any formation—hard or soft up to 20 in. in diameter and depths down to 600 ft.

It basically consists of a heavy-duty



rotary drill head with a three-speed transmission, a cargo-type hoist and a gear-driven positive displacement pump. A shot feed system carries the shot down the interior of the drill rods directly to the cutting bit. Drill cuttings are flushed to the surface.

A 15- or 25-ft derrick can be supplied with the drill and for portability the entire unit can be mounted on jeep, trailer or drag. Power can be supplied from the power take-off of a jeep or truck, gasoline, kerosene or diesel engine, air or electric motor.

For further information, write the Acker Drill Co., Scranton, Pa., for Bulletin 19.

Prepare Loco Data Sheet

The Mining and Industrial Electric Locomotive Section of the National Electrical Manufacturers Association has prepared a standard Mine Locomotive Data Sheet designed so mining companies can provide the exact information the locomotive manufacturer needs to avoid misunderstandings regarding specifications.

Part I of the data sheet deals with facts such as type of mine, system of mining, power supply, and data as to track, clearances and mine car.

Part II covers requirements such as type of locomotive and specifications with respect to length of haul, material moved, locomotive chassis, trailing cables, batteries and equipment.

Member companies of the Mining and Industrial Electric Locomotive Section are: General Electric Co., Goodman Manufacturing Co., The Jeffrey Manufacturing Co., Vulcan Iron Works, and Westinghouse Electric Corp.

—*Announcements*—

Lewis P. Favorite has been named manager of Aluminum Company of America's New York district sales office, succeeding **Edward B. Wilber**, who has been elected president of American Lumber & Treating Co. at Chicago, Ill.

Wilber succeeds J. F. Linthicum who is retiring from active management of the wood preserving company after fourteen years' service. For many years a leading figure in the industry, Mr. Linthicum will continue as a Director of A. L. & T.

Ray-Brooks Machinery Co., Inc., of Montgomery, Ala., and the **Tractor & Equipment Co., Inc.**, of Birmingham, Ala., were recently appointed distributors for **Bucyrus-Erie Co.'s** line of ⅜- to four-yd gasoline, diesel and single motor electric converticle excavators, the three-ton Hydrocrane and the recently introduced Hydrohoe, according to an announcement by the manufacturer.

W. G. Turner, former regional manager, **Cummins Southeastern Region**, with headquarters at Atlanta, has been transferred to Cleveland as regional manager, **Cummins Great Lakes Region.** This transfer in the Cummins regional organization is announced by L. W. Beck, vice-president-sales, Cummins Engine Co., Inc., Columbus, Ind.

Stuart E. Yeaton, general product manager of the electrical wire division, **John A. Roebling's Sons Co.**, Trenton, N. J., announced recently the appointment of **Walter Whiting** as Chicago district manager.

Effective November 15, 1951, the **Goodman Manufacturing Co.** of Chicago established a new renewal parts warehouse at Harlan, Ky., to serve mines in southeastern Kentucky, southwestern Virginia, and eastern Tennessee. **M. Curd Ferguson**, a resident of Harlan, has been appointed manager of the new warehouse.

The **Economy Pump Division** of **Hamilton-Thomas Corp.**, Hamilton, Ohio, is being consolidated with the **C. H. Wheeler Manufacturing Co.**, Philadelphia, Pa., another division of the corporation. Production, engineering and sales departments of Economy are being moved from Hamilton, Ohio, to the Philadelphia plant. Economy pumps will henceforth be known as **Wheeler-Economy Pumps.**

Harlowe Hardinge, president of **Hardinge Company, Inc.**, has announced the appointment of **William H. Shank** as public relations supervisor of the Hardinge organization, in addition to his present duties as advertising manager.

The **Mine & Smelter Supply Co.** has moved its El Paso branch into new office and warehouse space at 1515 Eleventh St., El Paso, Tex.

CATALOGS AND BULLETINS

AERIAL SURVEYS AND MAPS. *Abrams Aerial Survey Corp., 606 E. Siawassee Street, Lansing 1, Mich.* A complete explanation of aerial surveying, written in non-technical language. For a free copy of this booklet, write to the above address.

CRUSHING IN THE ALUMINUM INDUSTRY. *Pennsylvania Crusher Co., 1700 Liberty Trust Bldg., Philadelphia 7, Pa.* A dual-purpose booklet: first, to bring information on Pennsylvania's products to readers; and second, to cooperate with the aluminum industry in telling the story of aluminum. Copies can be obtained from the above address.

DORR THICKENERS. *The Dorr Co., Engineers, Barry Place, Stamford, Conn.* Bulletin No. 3001 covers the major types of Dorr Thickeners with text, drawings, photographs and size ranges. Also included are sections on control devices, special designs and the Dorr Co.'s engineering service.

GENERAL PURPOSE PUMPS. *Allis-Chalmers Mfg. Co., 972 S. 70th Street, Milwaukee, Wis.* Bulletin 52B 6351B describes construction details of grease-lubricated, pedestal-mounted pumps, available in capacities to 2500 gpm at heads of up to 550 ft, with stuffing box or mechanical seal, direct coupling or V-belt drive, and in a choice of materials. Copies of the bulletin are available upon request.

MINING MACHINE CUTTER CHAINS AND BITS. *Precision Chain Co., Terre Haute, Ind.* A complete catalog of all Precision chains and bits for all mining machines. Includes lacing charts for seven varied conditions.

Index to Advertisers

900 feet of trouble-free lubrication

• When operators of this midwest mine installed a conveyor in 1949, STANOBAR No. 2 Grease was selected as the lubricant for belt idler bearings on the recommendation of a Standard Oil lubrication specialist. Nine hundred feet long, and moving coal from mine bottom to tipple, the conveyor has boosted tonnage 300 to 400 tons a day.

There have been no bearing failures, no lubrication difficulties. STANOBAR is applied only twice a year.

STANOBAR's mechanical and chemical stability . . . the characteristics that have resulted in trouble-free lubrication of this conveyor . . . can also work to advantage in your own mine on a wide variety of jobs. Mine operators have found it especially valuable on ball and roller bearings which operate under a wide range of speeds and temperatures.

STANOBAR
TRADE MARK
Grease

A call to your local Standard Oil office is all that's necessary to put a Standard lubrication specialist to work on your problem. Or write: Standard Oil Company, 910 South Michigan Ave., Chicago 80, Ill.

What's your problem?

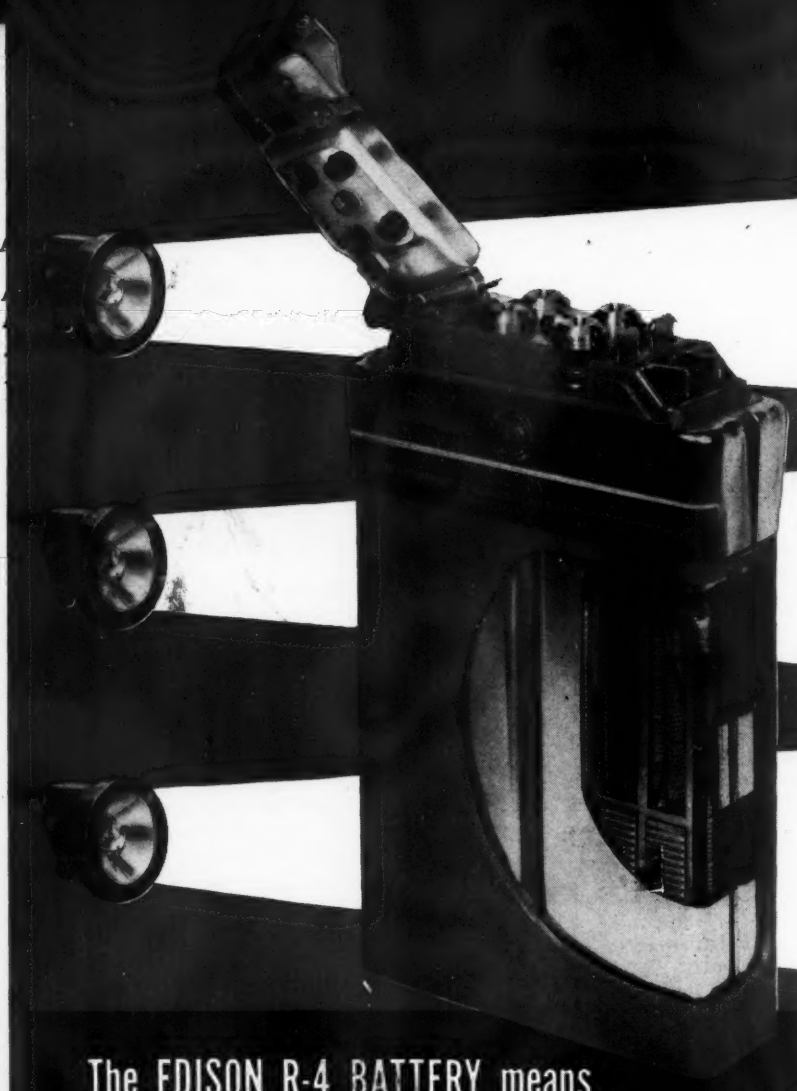
J. A. Grieve, lubrication specialist at Standard Oil's Decatur office helped this midwest mine make important savings with STANOBAR No. 2 Grease. He was close at hand, able to give mine operators the kind of service they needed when they needed it.

There's a corps of such lubrication specialists throughout the Midwest, one of whom is located near your own mine. Through special training, plus a background of practical experience, this man has a knowledge of lubrication that can mean real savings to you. To obtain his services, simply contact the nearest Standard Oil (Indiana) office. Discuss with him the savings you can make with such outstanding products as:

STANOIL Industrial Oils—Here's *one* line of oils that provides cleaner operation of loader and crane hydraulic units; supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

CALUMET Viscous Lubricants—On open gears and wire ropes, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire ropes.

STANDARD OIL COMPANY STANDARD *(Indiana)*

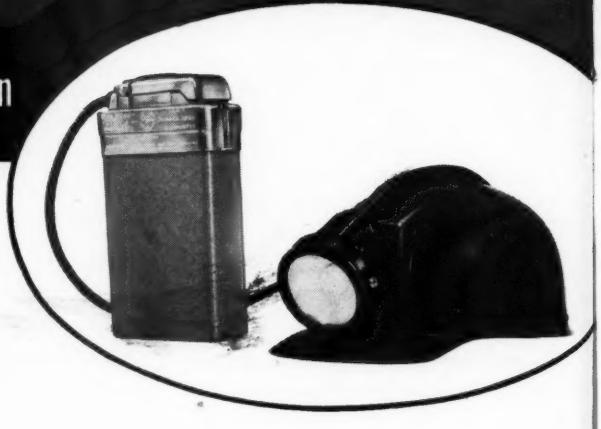


Does not deteriorate when not in use ...

Does not destroy itself to function ...

Exclusive Construction 4 Nickel-Iron-Alkaline cells arranged as twin units – increased voltage wattage, bulb efficiency

The EDISON R-4 BATTERY means Brilliant, Dependable, Unfailing Illumination



Here's the store-house for the dependable power output that provides a brilliant, unfailing beam from the headpiece of the Edison R-4 Cap Lamp. This ruggedly constructed 4-cell Edison Battery was designed and built for useful service life that is measured in years. Its unduplicated strength and endurance maintain full-powered illumination shift-after-shift, for years.

We will welcome the opportunity to arrange a practical demonstration at your convenience. Write, wire or phone.

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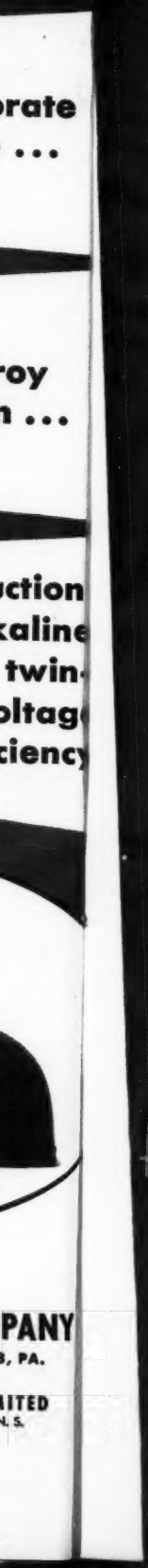
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